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THE GREAT EXHIBITION.

SCULPTURE.

OUR present sheet contains several Engravings of works in sculpture displayed in the present Exhibition, some of which may serve for illustration of the remarks which we have from time to time made upon the principles upon which this art should depend for legitimate success. We by no means approve of all these works; they are weak or vicious in many respects, but, as they have arrested, and still continue to engage, the attention of the public, we think it right to include them amongst our pictorial memorials of this great and national exposition. Amongst the foremost of this class are Kiss's "Amazon," and Simonis' two little juvenile subjects illustrative of joy and grief. These works, although of very dissimilar character, are all samples of a prevailing propensity with sculptors of the present day to extend the range of their art into a walk which, in our humble opinion, does not properly belong to it, at least, does not tend to exalt it. The same observation may be made of the little groups of a Girl and her Dog, by Benzoni, of Rome, given in a previous Number, from which it would appear that the practice we deprecate is not confined to the artists of any particular country, but is general, not to say universal. We may conclude, therefore, that it is popular; certainly it is art popularised.

What we object to in this new school is, that it endeavours to substitute incident for character; and converts the marble or bronze, as the case may be, into a medium for pictorial, not to say dramatic, effects. It involves combinations, also, which are incompatible with that unity of purpose and interest which are the legitimate attributes of high excellence in the plastic art. No doubt, it is easier to tell a story of violent passion, or of startling casualty, or of pretty childish fun, than to embody the appropriate attributes of a Juno, a Diana, a Jove, or an Apollo, a dancing nymph, or a dying gladiator; no doubt there are thousands who will understand and enjoy the former class of works, for one who could be able to appreciate even the intention of the latter. Let us not, therefore, attempt to deprive the multitude of art after their own taste, but neither let us, in awarding the praise due to such works, according to their class, be misunderstood to admit them to an equal rank in the temple of Fame with those which evidence the highest success with purer subjects.

For the Amazon, it is a figure of tremendous energy: the manner in which she is represented, as having thrown herself back out of her ordinary seat, in order to get out of the reach of the tiger, whose claws are already deep dug in the neck and flanks of the horse, whilst she takes deliberate aim for a single and critical blow at the head of the savage monster, is admirably conceived and carried out; the face, with its mixed expression of terror and determination, is of itself a study sufficient for an entire work in sculpture. The horse and the tiger are both masterpieces in their way, but unfortunately more than divide the interest with the human subject. It was a dogma of some modern writer on art, we think a Frenchman, that a piece of sculpture ought to have eight distinct points of view. We don't know whether this group may present so many but certainly it might be looked at from three or four different parts of the room, presenting almost a new picture on each occasion. This work is a copy from the original in bronze, erected before the Museum at Berlin.

KISS'S AMAZON.

As for M. Simonis' little urchins, they may almost speak for themselves. No. 1. The "Lappy dog" is gazing with delight upon a wooden Punchinello, which he evidently considers the perfection of art. And does not the very truth of this little episode come in illustration, and almost in confirmation, of our introductory observations about the tests of excellence, and the legitimate aims of sculpture? This little gentleman thinks his Punchinello a finer work than the finest in M. Simonis' *atelier*; he would rather have it than any of them; and the ignorant multitude, who, of course, can only truly admire what they understand, would like this little marble urchin better than the Apollo Belvidere. The other piece represents a boy crying over a little drum, which he has broken by over beating. The face is ludicrously true to nature and the occasion. As the introduction of baser animals, the dogs, for instance, in Benzoni's little groups, and the horse and tiger in M. Kiss's "Amazon," as actors, not to say *premiers sujets*, is a declension from the higher provinces of sculpture, the drum and the Punchinello in M. Simonis' groups are still more objectionable, as involving a degradation of art.

M. Le Seigneur's colossal group, in plaster, of St. Michael overthrowing the Dragon, which stands in the East Nave, is a specimen of the more exaggerated school which prevails sometimes amongst our French neighbours. It is vicious in composition, and disturbs the eye with innumerable angular projections; it has all the vice of ill-studied and incomplete action, whilst there is nothing in the character or expression of the principal figure to redeem the more glaring defects of the composition

RIDING GEAR AND TRAPPINGS.

SADDLERY is one of the industrial pursuits, in respect to which, as in respect to hardware and cotton manufacture, England will be generally allowed to head the world. To some extent, the strong national passion for sport and the turf has undoubtedly led to this result. The trade of the coachman and the groom—of everybody, in fact, engaged about horses, was and is one which gentlemen and amateurs of all ranks delight to have a hand in. There is in the process of driving, and generally in that of managing horses, a something that we take to with a kindness and a gusto genuinely national. To some small extent, we have inoculated the French with the feeling, but the turf is an exotic there. The Jockey Club of Paris is thoroughly exotic. "Four-in-hand" does not flourish kindly in the soil. The steeple-chase leads but a lingering life; and the *morale* of such a population as annually resort to Melton Mowbray would not be understood by a Frenchman, if you lectured him from now to Christmas on the subject. It is, then, no doubt, in a great degree, to our national love for horses and sports, and those occupations in which horses are engaged, that we owe the perfection to which saddlery has been carried amongst us. The horse tailor has been well superintended and guided and counselled by tastes more cultivated, and knowledge more extended than his own. The formation of the horse and the working of his muscles have been carefully studied, so as to adapt to him the most suitable form of trapping; while an exaggerated love for neatness and a certain easy elegance in the accoutrements of the animal—a feeling generally rendered by slang phrases, such as those which commend "a natty turn-out," "a slap-up drag," and so forth—has eventuated a system of harness manufacture, in which great lightness is combined with great strength, and the easy elegance in question is attained without anything like gaudiness or a meretricious display of ornament.

The show of English Saddlery and Harness, appropriately placed in the vicinity of the beautiful array of vehicles of all kinds contributed by our Long Acres, metropolitan and provincial, is a very interesting display of the firmest and strongest, yet the neatest and lightest looking work in leather. We have several models of horses, like *Macbeth*, "with harness on their backs." The spectator will contrast the small quantity of glittering metal used for ornament in these "suits," compared with the Canadian and American harness, as well as some of the work sent from Belgium and France. He will note, however, the superior polish of the leather, and the tact with which the thickness and heaviness of the straps have been diminished to the furthest point consistent with due strength and solidity; while he will admire the extreme neat-handedness of the work—the sewing, for example, which seems as delicately managed as if a lady's fingers had conducted the operation upon silk, not leather. No new forms of harness, however, are, so far as we observed, exhibited. In this respect we were certainly disappointed. The old collar, and the old shoulder-straps and bearing-reins, still bear sway, though great attempts have evidently been made to improve the collar—to make it sit as easily as possible upon the horse, and to keep it from ruffling or pinching the shoulder; and a number of collars laying claim to various merits of this kind are exhibited. But with all these improvements the collar appears to us to be a clumsy way of harnessing a horse. The article, though infinitely lighter than it used to be, is still unnecessarily heavy, and few horses escape an occasional frayed neck and shoulders from its action. Two or three years ago the was some hope that a reform in this respect had commenced. The collar was in many instances given up, and a broad and handsome belt, crossing the chest of the horse above his forelegs, was substituted for it. So far as appearances went the change was a great improvement; but the belt seems rather to have lost than gained ground. We very seldom observe it now. It has been said that the pressure of the leather upon the horse's chest prevented the free play of the lungs, when dragging a vehicle up hill; but it strikes us that the belt might have been so arranged as to lie principally on the shoulder and neck, in which position it would have all the advantages of the collar without its clumsiness or weight. At the same time as the introduction of the belt in question, a fancy came up for abolishing the major portion of the harness worn by gig and carriage horses as actually useless. Many of the omnibuses at once gave in their adhesion to this new school, preserving, out of all the paraphernalia commonly used, the simple traces, collars, and reins. The effect to the eye was odd, and has been described by the gentleman, whoever he was, who said that it seemed quite improper to put naked horses into a public vehicle, and drive it through the streets. Since then, however, we observe that the old fashion is reviving. The horses have been restored to the full enjoyment of their ancient wardrobe, no doubt to the great delight of the harness-makers, who must have looked upon the new lights, as to horse trappings, with a peculiarly evil eye. As might be expected, then, the craft in question has refrained from giving in its adhesion in any respect to the scanty harnessing doctrine by presenting specimens of the style. On the contrary, not a strap has been omitted which could be inserted, and the horses will be in no respect obliged to the Exhibition for any diminution in the weight of the leather they are destined to carry over and above their stipulated burden.

Talking of harnessing matters, the abolition of blinkers is a reform which has been long agitated, and in which the weight and reason appears to us entirely to lie on the side of the anti-blinkerites. In fact, the whole blinker system, as regards men as well as horses, and moral doctrines as well as visual impressions, is a mischief and a delusion. Let us see—men and horses—all that there is to be seen; and if what we do see be wrong, let us correct it, so that we may gain future pleasure by the spectacle. What is the use of shutting our eyes, or causing our weaker brethren—whether on two or four legs—to shut their eyes, wholly or in part, to objects around them? The chance is, that the result will be the very catastrophe which we seek to avoid. A roadside object half seen—through the uncertain glimmer permitted by the blinker philosophy, becomes a bugbear; and away we go awfully frightened, and kicking up our heels, and perhaps upsetting the coach in our panic at a solemnly innocent donkey, quietly making his dinner by the hedge, but which, by reason of these stupid blinkers, we mistook for a griffin, or a dragon, or a roaring lion, or something more dreadful and astounding still.

As to the practical part of the argument touching horses—the blinkerite party will have it, that unless a horse be three parts blinded he will be sure to take fright and run away. "Take off the blinkers," they say, "and see how startled he is." Of course, until he has got accustomed to the new state of things. Put blinkers over the eyes of a horse who had always been allowed to use his optics as nature intended, and the creature would be in a greater panic still. The simple fact, that saddle-horses are not blinded, settles the whole question; or, if the blinkerites try to get out of the loophole that they do not start because they are not drawing vehicles behind them, we reply with the clincher that dray and cart-horses do not start, they being generally free from blinkers; and that on the Continent, both in France and Germany, we have travelled hundreds of miles behind teams of horses who never had a blinker on their eyes. But the blinkerites—moral and physical—never understand logic. We would only hint to the sticklers for the old system, that they might keep it up and welcome, if they only introduced a change in the material of the implement, and made their blinkers—of glass.

In our saddles we see that the tendency of the manufacture is to make the article as small, light, and easy-sitting to the horse as possible. Many of the saddles exhibited in the English department are triumphs of neatness. Those sent to us by foreign nations are invariably clumsier and heavier, and not a few fell under our inspection in which the seat of the saddle was full of wrinkles and folds which would have tried the endurance of the most hardened horseman. In ladies' saddles, three horns are now generally used, instead of the two old-fashioned ones; and several are so constructed as to shift from side to side, at the pleasure of the fair equestrian. The Canadian sledge harnesses are constructed upon the general model of our carriage trappings, but seem slighter and weaker, while the workmanship is provincial and unfinished. Possibly so much strength is not required, as the draught of a sledge is slight. These harnesses are all fitted with bells, of the same form as the French *grelots*. It is only from the few ancient waggons which still contiue to crawl on the less-frequented highways of England, that we now hear, in our own country, the once-universal jangle of the moving team. Our stage-coaches have long disused the metallic music as something puerile and absurd; and yet that low, incessant, tiny, tinkling peal had its beauty and its soothing effect. Often, often has it lulled us, leaning lazily back in the dusty depths of the diligence *banquette*, as the mountain-like vehicle went thundering and lumbering along its path—the sweet, clear music of the bells forming a running treble melody, backed by the monotonous ground bass of the wheels.

Turning from Europe, we may glance a moment at the horse-trappings and furniture of the East. The saddles, both for barbs and camels, displayed by Turkey, Egypt, and Tunis, are principally state affairs, intended only for use by the grandees on high-days and holidays, and blazing with as much and as brilliant decoration as if they had formed part of the caparisons of an Astley's pageant. Only a few ordinary work-a-day saddles are shown in the Tunisian department. The general construction of both, however, is identical. They are somewhat like our own old demi-pique saddles; the rider sitting low, and fortified in his seat by the huge upright pummels, or pillions, before and behind him. From these saddles a fall would be almost an impossibility. The gala articles are very splendid: a vast quantity of cloth, generally red, and so stiffly and thickly embroidered with gold as to be almost like armour, descends from the saddle, and completely covers the flank of the horse. The garniture is never complete without holsters for pistols, and altogether the caparisons of an Eastern steed must often be as valuable as the animal which they adorn. A few saddles are made like mere pads, covering a large space of the horse's back, and apparently intended for ladies. These, like the riders, are all gaily adorned with gold, or, if not with gold, with tinsel, which looks just as well and makes as brave a show. The bridles and head accoutrements are generally formed of narrow but very thick straps clumsily wrought, and ornamented here and there with roughly fashioned ornaments of metal. The bit is the most remarkable part of this portion of the riding gear. It is terribly severe, and would, we should think, conquer and reduce the very hardest mouths. All the Oriental bits are much upon the same principle, with a circular or oblong metallic ring, which lies upon and presses the horse's tongue, while the curb being very long, the leverage is proportionally great. There are few, even of the most determined bolters, we should think, who would run far against the will of their riders or drivers with a Turkish bit in their mouths. The stirrups commonly used serve for spurs as well as for their legitimate purpose; and huge clumsy lumps of metals, particulary the Moorish and Arabic stirrups, they are, being in fact, a sort of semi-slippers of iron, which cover all the instep of the foot, ending with sharp projecting points and angles, a dig from which would punish a horse more severely than the operation of the most long-rowelled spurs. The camel saddles commonly used, and the best specimens of which are exhibited in the Tunisian department, are mere bundles of course cloth, straw, and wood-work, heaped round a central pillion, to which the rider clings with hands and legs if necessary, as the beast progresses in his uneasy shambling trot. In the Indian collection there is a curious specimen of a camel's or dromedary's saddle, fitted with a brass swivel gun, which can be swung round so as to fire either sideways or over the animal's head. One or two handsomely embroidered camel's saddles and accoutrements are also exhibited in Turkey and Egypt; but the animal being principally used as a mere beast of burden, his ordinary trappings seem to have been accounted too common and coarse affairs to have been brought over. A ride upon the back of either camel or dromedary is generally described as something to which the sensation of sitting a high-trotting horse is like lying in a well-stuffed easy chair. Albert Smith, in his recent book of Eastern travel, recommends any one who wishes to obtain a notion of the paces of the "ship of the Desert," to perch himself upon the top of a music-stool screwed up to its full height, to place the stool in a rough cart without springs, and then to drive the cart at a good trot athwart a ploughed field. In the same book, however, and on the same subject, the author, in falling foul of some alleged shams, says that the camel is a great obtainer of pity under false pretences, and he backs the assertion by citing the fact, that the animal will moan and cry if you only make believe to load him, and place not more than a few ounces on his back. Now, with submission, however, we take this very statement as entirely proving the fact of the general overloading of the poor beast. He always connects the operation of loading with cruelty and overburdening, and moans and sighs in consequence. The very fact, that when the pretence of loading excites symptoms of distress, proves what the reality of loading must be.

IRON ORES, IRON AND STEEL.

OF all substances in nature that are available for the purposes of man, and have assisted in advancing him to that high position in which he is enabled to command and guide mechanical force to an extent almost unlimited, there is not one that can be regarded as more important than iron. Without this metal the stores of mineral fuel must have remained unemployed, or at least must have been of comparatively little value; without it, the other metals, however valuable and useful, could hardly have been obtained for use; without it, the earth itself could hardly be made to yield, at least in cold and temperate climates, those abundant returns of food which support millions of human beings in health and comfort; and without it there could have been no such systems of communication between distant lands connected only by the ocean, as are now found to be true sources of commercial wealth, and of the advantages of which we Englishmen have the best knowledge of any people in the world. Gold and silver without iron are mere toys for children and savages; precious stones without iron remain encrusted with the matrix, which prevents their beauty from being seen; various earths and metals now of enormous value would be unknown and unattainable without the iron implements by which they are produced; and steam, that source of all power, that giant by whose services the most impossible things are effected, would sleep at rest, or, if employed, would be occupied in the merest trifles, if it were not that its forces are concentrated, and its powers directed by the iron prison in which it is confined, and the arms by which it works. Look where we will, in the vast forest of human constructions, within the walls of the Crystal Palace, we shall everywhere see contrivances in which iron holds a prominent part, from the pillars and girders that support the Building itself, to the nail and the pin that connect the different parts of the smallest object exhibited within it. Well then may we rejoice in the stores of unsightly but invaluable nodules with which many parts of England, Wales, and Scotland abound, and of which there are large collections in the Building; well may we be proud of the contrivances shown in numerous models, by which the metal is obtained from these unpromising ores, and but little excuse can be needed for a long and detailed account of such treasures by any one who looks for information as well as amusement, while traversing the avenues of our Palace of Industry, and while endeavouring to realise to himself the origin of those accumulated riches, and that display of the results of human labour and ingenuity spread on all sides, and inviting attention. We propose, therefore, to consider to-day the various sources from which iron is obtained, the mode of obtaining the metal, the methods adopted for preparing it for uses of various kinds, and the applications commonly made.

Perhaps it may be well, however, first of all to mention the chief properties that give a value to this metal. The first of these is its hardness, which is always considerable, but may be varied by different modes of treatment, and in one state (that of steel) may become so great as to cut all but the very hardest substances in nature. Owing to its hardness, iron is well adapted for making all kinds of tools and implements, and the use of it now is so extensive in this respect that hardly any limit can be put to its employment. Next to hardness, iron is remarkable for its tenacity, in which, when pure, no metal surpasses it. A wire, 1-12th of an inch in diameter, will support a weight of a quarter of a ton without breaking. It is needless to enlarge on the advantages of such a property, and the application of iron wire in the manufacture of ropes and chains are examples of this power of tenacity, which will occur to every one.

The next remarkable property of iron is its malleability, which is greatest at a high temperature, and in consequence of which it may be hammered into almost any shape, and rendered available for innumerable important uses. Every one is aware of the facility with which the blacksmith at his forge will mould a piece of red-hot iron into the required form; and those who have visited any large manufactory in which iron is worked will know of yet further operations of a far more astonishing kind. The visitor to the Exhibition may see innumerable examples of the malleability of iron in every part to which he turns his attention, but especially amongst the machinery.

In the further application of heat, iron exhibits other properties equally remarkable and useful. It can be fused when nearly pure, but requires for that purpose the very highest degree of heat producible by a strong blast. Although thus difficult of fusion, however, there is no difficulty in uniting two pieces at a far lower temperature, for this metal is capable of "welding," a name given to the union of two surfaces by a kind of cementation, obtained when both surfaces are at a high heat and very clean, and are then hammered together. Few metals, and no other substances known, exhibit this property, but its value is too manifest to need further remark.

Although iron in its pure state is tough, almost infusible, malleable, and admirably adapted for various purposes in which great strength and tenacity is needed, there are yet other uses in which a more fluid condition is desirable, and others again where a far greater degree of hardness is wanted. Both these are obtainable, however, by a very slight admixture of a substance so common as charcoal (carbon), which in different proportions renders the iron either so easily fused as to be readily cast into moulds, or so intensely hard as to form steel. In the ordinary method of reducing the metal from the ore, a number of impurities remain, the proportion of iron not exceeding from 91 to 95 per cent., although of the remainder not more than from three to four per cent. are carbon, except in very unusual cases. This small percentage suffices, however, to alter the character of the product so far as to give a peculiar granular texture, sometimes almost crystalline. The metal is also then more brittle, lighter, and more fusible than malleable iron. At a red heat, when the iron is made with charcoal, cast iron is so soft that it may be cut with a saw, and in this state by admixture with a small quantity of other substances it may be rendered far more fusible.

When iron, cast into pigs with the impurities already alluded to, is subsequently melted and exposed for some time, in a fluid state, to the air, it parts with the greater portion of such foreign substances, becoming at length less fluid and much more pure. When in this state, if it is removed from the furnace, exposed first to the violent blows of a heavy hammer, and afterwards passed through heavy rollers, it is brought into the state of wrought or bar iron. The purest kinds of wrought iron still contain a certain portion of carbon (not exceeding five parts in a thousand, and often not exceeding two), but in this state the metal is tough, solid, better adapted than cast iron where durability and strength are needed, and having a very distinct texture. Soft bar iron is more free from carbon than hard, but no additional hardness is produced by rapid cooling after exposure to a high heat, as is the case both with cast iron and steel.

When pig iron, containing little besides carbon, and perhaps manganese, is first refined by exposure to the blast under charcoal, and then made into flat bars, and these bars cut into lengths and welded together into bundles, they become what is called *shear steel*. This, again, when exposed for a period of from five to eight days, at a red heat, in pots filled with charcoal powder, becomes altered by the absorption of carbon, which penetrates the iron, and when it meets with any oxidised portions produces blisters, forming thus *blistered steel*. This fused under pounded glass, with or without carbon, and then cast into ingots, becomes *cast steel*. In this last state, it is fit for use in the arts, and is somewhat whiter than iron, and has a distinct fracture; when made red hot and slowly cooled, it becomes soft, but when re-heated and suddenly cooled, it may be brought to almost any degree of hardness, being then also very elastic, more or less brittle according to circumstances, and capable of use for a variety of important purposes. The nature of the resulting steel is almost entirely affected by the temperature to which it is raised before cooling, and by the mode of cooling; and as the temperature is marked by the colour which the metal assumes while re-heating, this is commonly referred to as an indication of the temper. The order of colours is, straw-yellow, deep yellow, purple, violet, dark blue, and light blue.

The sources from which iron is obtained vary much in different countries; but the common ores are oxides and carbonates, of which there are several varieties. The richest is the magnetic iron ore, containing upwards of 71½ per cent. iron, and either itself magnetic or readily attracted by the magnet. It is of iron-black colour, brittle, and often crystalline. Little of this ore is found in England, but large quantities occur in Scandinavia, Russia, and India, which are all celebrated for the quality of the steel manufactured from their iron; and it is abundant, also, in North America, Mexico, and Brazil. The ores of this kind are reduced generally with charcoal, and on rather a small scale, and are easily brought into the state of pig, having few earthy impurities mixed with them. All the finest steel is made from magnetic ores; and fine samples of the ores themselves, and the pig and bar iron manufactured from them, are exhibited in the Russian and Scandinavian divisions. From India, also, besides a large series of ores, there will be found a case containing the various conditions of the iron, including the steel in various states known as *wootz steel*, and exhibited by the Indian Iron and Steel Company. The large and highly-important series of Sheffield goods on the British side must also be mentioned here as presenting the best and most valuable illustration of the products obtained from the magnetic ores. Amongst the Sheffield goods are also to be found one or two models—one in particular, of large size and in great detail, illustrating the whole of the processes adopted in converting iron into steel, and bringing this very remarkable compound of iron and carbon into a state available for the manufacturer. We refer to the model of the Cyclops Works in Class 22, No. 109 A, which is accompanied by a series of articles in steel of great interest. No one can examine the articles exhibited in the Sheffield court without being perfectly satisfied of the high state of perfection which the manufacture of steel has attained in this country, and the importance of having the best material for such admirable workmanship. There is generally understood to be a greater amount of elasticity, and a susceptibility of finer temper in the steel made from Indian iron than that from Sweden; and it has been supposed by very eminent chemists that this is owing to the presence of a small quantity of aluminium; but it must as yet be considered doubtful whether this is essential or accidental.

Before concluding the notice of the magnetic ores, we should direct attention to those obtained in British North America, where are some fine specimens indicating a source of wealth which will not, we are sure, be neglected.

Next to the magnetic ores, the richest material from which iron can be obtained consists of the peroxide known to mineralogists as the specular iron ore, micaceous iron ore, red hæmatite, and oligist respectively. This ore is also sometimes called iron-glance. It exists in two forms—the one earthy, and the other crystalline and metalliferous; but both are equally rich, and yield, when pure, about 69½ per cent. of metallic iron. These ores, like the former, are not those generally found and used in our own country, although they exist there in considerable abundance, and are even used extensively to mix with and bring to a convenient average some of the poorer ores. The more brilliant and metal-like specimens chiefly abound in Elba, and are often called Elba ores; but these and other less glittering forms also occur in almost every district where iron is found in mineral veins. They are worked in small furnaces almost as easily as the magnetic kinds, but are nowhere so valuable for the manufacture of steel, although, like the former, they are smelted with charcoal only. The Belgian ores, and those from Spain, may be quoted as examples of these, and the admirable quality of the iron exhibited, and of the goods manufactured of such iron, shows clearly that if it cannot vie with that made in England in the matter of cost, it may yet take a very high place for toughness and durability. It is chiefly the earthy varieties (hæmatites) that are used in England, and of these many specimens, very remarkable for size and beauty, will be found in Class I., both from Cornwall and Lancashire, exhibited by various persons, and amongst the rest by Mr. Thomas Ainsworth, of Cleator near Whitehaven, No. 422, and Messrs. Harrison, Ainslie, and Co. (405), of Newland Furnace, Ulverston. In both these cases the ores contain from 60 to 65 per cent. of iron, and are found immediately adjacent to the poorer ores common in England, and also to the coal, so that they are brought into immediate use. The quantity that can be supplied is very large; but there are at present, we believe, only three furnaces in blast. The iron is considered to be of very good quality.

In some parts of the world large quantities of hydrous oxide of iron are obtained in a state very well adapted for the manufacture of iron. Such, for example, are the bog-iron ores, of which there are magnificent specimens from Canada (160 to 163), said to produce excellent metal. In its pure state, this hydrous oxide would not yield more than 56 per cent. of iron, and from 12 to 18 per cent. water; but it is rarely found in large

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quantities having anything like this value. The technical name for the ore in question, as a group, is *brown hæmatite*, and they may be regarded as averaging 20 to 40 per cent. of iron. Large quantities occur in the northernmost counties of England, in distinct and regular beds, associated with the lead veins of that district. Fine specimens will be found in Mr. Blackwell's collection of iron ores (427), bearing the numbers 413 to 421 inclusive.

But the ores of chief importance to England, and those supplying by far the largest proportion of all the iron manufactured in the world, are neither the richest in quality, nor those deposited in the thickest masses, but another series, far less likely, at the first glance, to attract attention, and requiring methods to reduce them of a more complicated kind than the simple forges hitherto needed. We allude to the *clay iron-stones*, as they are called, which are widely distributed with the coal, and near the limestone, in South Wales, North Wales, Shropshire, Staffordshire, Yorkshire, Derbyshire, and Northumberland, and the valley of the Clyde. These are the true materials of England's greatness, and these, accordingly, have long been anxiously sought after, and most carefully worked. From these sources upwards of two millions and a quarter of tons of iron are annually produced; of which South Wales furnishes 700,000 tons, South Staffordshire (including part of Worcestershire) 600,000, and Scotland 600,000 tons. Of the ores from these several districts, there is one large and most valuable series of about 500 specimens, very carefully selected, and exhibited by Mr. S. Blackwell, of Dudley—a gentleman who deserves the utmost credit for having, at great expense of time and labour, brought together these materials, and arranged them as a noble illustration of what nature has done for the British Islands in reference to iron.

All the clay iron-stones partake of a general character, although they differ a little in appearance, and much in relative value. They are nodules, consisting of an impure carbonate and oxide of iron, mixed with clay, and apparently separated from a more generally diffused ferruginous condition, in a large series of deposited rocks, including much clay and much vegetable matter. They occur in bands generally of no great thickness (often only a few inches), and not far from thicker bands of coal, with which they are worked. The quality of the iron made from them varies a good deal—partly, it may be, from the condition of the ores, but chiefly from the fuel with which the ores are smelted and refined. We cannot too often or too distinctly recommend the reader to study this collection by Mr. Blackwall, in connexion with the list of details contained in the larger or Illustrated Catalogue.

The manufacture of iron from these poor ores is conducted on a very large scale in furnaces constructed at great cost and kept constantly at work for a long time. Described in their simplest form, these furnaces consist of a receptacle at the bottom for the fused iron to collect in, and from which it can be drawn off from time to time; a chamber to receive and fuse the mixture of ore-flux and fuel put in from the top, and a blast to produce intense heat. The chamber is generally high and partly chimney-shaped; the blast is conducted by pipes from a machine where it is produced, and there are means of drawing off not only the metal, but the slag or scum that forms on the top of the fusing mass. The furnace being already heated, a due mixture of material, consisting of the ore (consisting of carbonate and oxide of iron, with alumina and silica), limestone, and coal or coke, are thrown in from the top; the alumnia and silica of the ore then combine with the lime, forming a kind of glass under the influence of the burning fuel, acted on by a powerful blast, sometimes of hot air, and the iron is set free and sinks in a fluid state to the bottom. The floating slag may be drawn off from time to time, and the charge of ore-flux and fuel repeated till a sufficient quantity of fused metal is collected. The charge is added, and the metal drawn off generally at regular intervals, and the result is the production of pig-iron. The further processes have been already alluded to. Very fine specimens of pig and bar-iron are exhibited both in Class 1 and Class 22. Among the latter, the Low-moor Works, near Bradford, Yorkshire (Messrs. Hind, Dawson, and Hardy), present a series extremely remarkable for their variety and great excellence, some specimens of rivet-iron, knotted cold with two or three knots, and bent at one end, showing very strikingly the tenacity of iron in a wrought state. This is shown still further by a piece of chain-iron, originally 4 feet 5 inches long and 1½ inch diameter, strained and broken by a weight of 34 tons, but which, before being broken, was drawn out as much as 10½ inches, and was reduced to a diameter of ¾-inch. Other fine examples of good bar-iron, adapted to various purposes, are exhibited by the Ebbw Vale Company, South Wales (Class 1, No. 412), and by Messrs. Bird and Co. (No. 411), who show admirable specimens of Staffordshire iron. The products of the Scotch iron and coal-fields are presented by the Monkland Iron and Steel Company (No. 426); and, before leaving this part of the subject, we ought to direct attention to Mr. Stirling's patented method of mixing together malleable and cast iron, and also of mixing other metals (chiefly zinc) with iron to produce greater strength in the compound. Ireland, also, is not unrepresented, and we would especially refer to the specimens exhibited from Arigna by Dr. Moore (No. 408), which show iron as made from charred peat. The quality appears good, but the economy of the operation is still doubtful. The ores are rich, yielding as much as 40 per cent. of iron. Coal exists in the neighbourhood, but it is not of excellent kind, and the cost of the ton of iron manufactured in this locality must be reckoned as not much under £4, a price too high to promise much success at present.

Other ores of iron are occasionally used, and are also deserving of notice. Thus, the pure crystalline carbonate (spathic iron) is a very abundant and important ore in various parts of Germany, especially the Rhine provinces of Prussia, Nassau, and Styria, and from each of these districts there will be found specimens both of the raw material and the manufactured iron. The Austrian is particularly worthy of mention, as providing a large quantity of metal of admirable quality, and yielding by the first process of smelting an iron which contains less than the usual proportion of carbon occurring in the pig, and scarcely any impurities, so that it is at once a kind of steel. Being made with charcoal, and not in very large quantities at a time, this iron is tough and hard, and has been found valuable in the manufacture of scythes, of which vast numbers are annually distributed over Europe, from the various works situated near Grätz. The iron thus made is rather costly; but where there is a heavy duty on foreign imports, and a yet higher expense on account of land carriage over difficult roads, it can find a market, and meets with a very active demand. The spathic iron is remarkable for its resemblance to common limestone in appearance, It is, however, heavier, and turns brown on exposure. It is generally combined with manganese and lime, and when pure contains from 40 to 50 per cent. of metallic iron. Before use it is broken up and exposed in large heaps to the air for a considerable time, and is then roasted and treated like the earthy carbonates.

In France and Switzerland various ores of iron are worked, that differ much in general appearance from those found in England. Thus in the former country large quantities of a pisolitic ore (an ore occurring in small rounded or pea-shaped masses) occur in the tertiary and alluvial rocks in the departments of the Jura, the Lower Rhine, and Côte d'Or, and supply one-third of the iron of France. A silicate of iron occurs in Switzerland, and is worked there to some extent, both for iron and steel; and in the United States of America, a mineral elsewhere rare, and consisting of a peroxide of iron combined with a considerable percentage of manganate of zinc (Franklinite), appears to be present in sufficient quantities to be worth working, and is exhibited in connexion with the iron made from it.

The manufacture of iron on a large scale has been already partly described in speaking of the management of the abundant British ores. The outside of the furnace is generally conical, the inside being more nearly pear-shaped. The whole height of the furnace varies; but, as a convenient standard we may take about 60 feet. The lower part (the hearth, which may be described as the stalk of a pear) would then be about 6 feet high and 2 feet square at the base, enlarging gradually towards the upper part. Above this is a funnel-shaped portion, about 8 feet high and 12 feet diameter at its top or widest part, and called the boshes. The rest of the interior gradually diminishes from the top of the boshes, and is called the cone. At the upper end it is about 4½ feet diameter, and receives the charge of ore, flux, and fuel. A cylindrical chimney rises above the top of the cone, and may be from 8 to 12 feet high. The whole of the inside is lined, the lower part with a coarse gritstone, and the upper with fire-brick. The bottom of the furnace is packed with sand each time the metal is drawn. The proportion of the different parts of the furnace differs in different parts of the country where iron is made.

In order to produce the required heat, a strong blast of air is driven by machinery into the furnace, when in operation, by a couple of tubes (called twyers, or tuyères). The blast-furnace is a most important part of the system, and involves considerable machinery. In some cases, the air is intensely heated before being employed, but this is not done generally with the best iron. The size of the orifice through which the blast comes, is from 2 ½ to 3 inches diameter. The pressure of the air is between 2 lb. and 3 lbs. to the square inch, and an ordinary furnace will require nearly 400 cubic feet of air per minute.

Before using a furnace for iron-making, it must be heated or put in blast, an operation which requires a fortnight or three weeks to perform. When this is done, the coke, the ore, and the flux are put in at intervals, in regular order, keeping the furnace always full to the top of the cone. A moderate-sized furnace will take, in 24 hours, about 15 tons of coke, 16 of roasted ore, and 7 tons of limestone, from which about 7 tons of iron are obtained, which is run off every twelve hours from the front of the hearth. The melted iron is received into moulds made in soft and pure sand, and the pigs thus made weigh about 2½ cwt. each.

From the blast-furnace the iron is taken to the finery furnace, where it is re-melted, and run out at a loss of from 12 to 15 per cent. or more; the pig parting with a large portion of its impurities of becoming what is called fine metal. This is suddenly cooled by throwing water on it, and is thus rendered very brittle; and for the finer purposes of iron manufacture, especially where toughness is required, charcoal is used in this process.

The fine iron broken into fragments is again exposed to intense heat in a peculiar reverberatory furnace—the puddling furnace; and after a certain amount of exposure in this way it parts with the greater part of its carbon, becomes much more infusible, and at length solidifies into a tough mass, being worked by a rake into rounded balls (blooms) of about 60 or 70 punds weight. These, after again heating and hammering, are in a condition to be presented to the rolling machine, and then become bar or wrought iron.

There are many differences of detail in the methods employed on the Continent, and even in particular districts in our own country, but this general account will enable the reader to understand something of the labour and difficulty, as well as cost, required to produce a material which is, however, as we all know, supplied at a price which brings it within the daily use of every person for the very commonest purposes. It may give an idea of the magnitude of the work to mention that there are now 185 blast furnaces for the manufacture of iron in South Wales, 143 of them being actually at work, and producing, on an average, 100 tons of iron per week; that in Shropshire, and its neighbourhood, there are 28; in Staffordshire, 108; and in the more northern counties, 46—such furnaces making in all 192 in blast, in addition to the 143 in Wales. Scotland adds its share to the list, and the general result is, as we have said before, that the enormous quantity of 2,250,000 tons of iron are now annually manufactured in the British islands, being at the rate of 2 cwt. a year for every man woman, and child of the whole population. As not less than 3 tons of coal are required to produce each ton of iron, this manufacture also requires a consumption of 7,500,000 tons of fuel, without including that employed in the further operations of iron-making, and the incidental uses of coal in various ways.

LIGHTHOUSES, AND LIGHTHOUSE OPTICAL APPARATUS.

IN considering the important and interesting subject of Lighthouses there are few people in England who will not immediately call to mind those hardy sons of the ocean, who are the chief objects of its structure. Everybody remembers the old song which compares their life with that of the well-housed gentry on *terra firma*:—

> Ye gentlemen of England,
> Who live at home at ease,
> How little do you think upon
> The dangers of the seas.

But the old song is by no means so applicable to our own day as to former times, when it was so much sung. As to living at home "at ease" in these days, when men work harder than ever, as the Great Exhibition of Industry fully attests, we will say nothing; but, with respect to the want of thought among those ashore for the men who brave the perils of the ocean, "where the stormy winds do blow," we think that nothing could more strikingly attest our consideration, our anxiety, and our practical care, than the existence of the numerous lighthouses that stud and star our coasts. Wonderful structures they are, and as useful as wonderful. Considering the great dangers of St. George's Channel, and, indeed, of the whole coast of the United Kingdom, we may fairly say that the existence of a regular system of lighthouses, and other light beacons, is absolutely necessary to our present state of navigation, and the enormous increase of foreign as well as domestic shipping, and the coast trade generally.

In the Main Avenue west of the Great Exhibition may be seen two specimens of lighthouse apparatus (No. 84)—the larger one being on the cata-dioptric system of the first class of lights (near the astronomical telescope); the other, a dioptric apparatus of the fourth class of lights. Several excellent models of lighthouses will also be found in the central North Gallery (No. 51), in which the apparatus of each of these classes may be more narrowly inspected: and a variety of models, both of towers and lanterns, in the North Gallery.

No models, however, can give any idea of the extraordinary difficulties and dangers attending the erection of lighthouses, concerning which our readers will, we trust, find the following account both interesting and worthy of an attentive perusal.

Some rude kind of lighthouses appear to have been used by the ancients, but the principal lighthouse of modern times, and certainly one of the most magnificent edifices of the kind ever built or ever designed, is the Tour de Corduan, at the mouth of the river Garonne. It was commenced in the year 1584, and occupied twenty-six years in building. We scarcely need say that difficulties, in most cases, occur in the erection of lighthouses, to which no other structures are liable. The building of the Eddystone Lighthouse is a remarkable instance of this. The number of dreadful vicissitudes it encountered are as painful to contemplate, as the courage and perseverance that finally overcame hem are worthy of admiration. It was originally first built of massive beams of timber, and a light was first exhibited in 1698. The architect and engineer by whom it was designed was Mr. Winstanley. But the sea frequently rose so high around it as to dash over the light—in fact, it was said, at times, that the lantern was buried under water. Mr. Winstanley thereupon raised the tower from 60 feet to 120. The space of rock for the foundation being but small, and the situation most frightfully exposed, this was, of course, a work of stupendous difficulty. By some it was thought that he had now carried it too high for safety. They were, unfortunately, very right in their apprehensions. Not long after its completion, considerable repairs were necessary, and Mr. Winstanley went there in person, accompanied by his workmen. The repairs occupied some time; and one night a terrific storm arose, tore down the lantern and the upper part of the tower, and finally carried the whole edifice away, with poor Winstanley and all his workmen, every one of whom perished: indeed, we believe their remains were never found, nor a single wreck of the once proud structure.

Very soon after the destruction of this lighthouse, the *Winchelsea* man-of-war was wrecked on the Eddystone rocks, and her crew were lost. As it was now seen that a new lighthouse must, by some means or other, be erected here, another tower of timber was designed by Mr. John Rudyard, of London; it was finished in 1708. Its height was 92 feet. The construction was admirable for its strength and tenacity, so that it remained standing during forty-seven years. But another and more unlooked-for misfortune awaited it. Everything had been devised to protect it from the fury of the waters; nobody had ever dreamt of danger from fire in such a situation, so surrounded by the natural antagonist of this element. By some accident, however, it took fire, and, being entirely of wood, it burned down to the very water's edge. This was in 1755.

English perseverance was again called into requisition, a lighthouse must be erected on this spot: this was determined: and in 1756 Smeaton first landed on the rock, and commenced operations by cutting the surface into regular horizontal trenches, and into them a foundation of stone was carefully fitted. It was now resolved (they had had enough of wood) to build the whole edifice of stone. The first 12 feet of the tower, as we learn from Mr. Alan Stevenson, form a solid mass of masonry; and the stones of which it is composed are united by means of stone joggles, dovetailed joints, and oaken tree-nails. An arched form was adopted for the floors of the building, with a view to greater strength; but to counteract the outward thrust of floors of this form, circular grooves were cut in the stone of the outer casing, into which a belt of iron chain was laid, and made compact with the stone by filling up the intervals with melted lead. The structure was completed in 1759, and the light was first exhibited in October of that year. The state, however, of lighthouse optics at this time in England was so low that all the illumination obtained was derived solely from tallow candles. Nearly fifty years elapsed with this wretched light before argand burners were adopted, though this great improvement was well-known during upwards of twenty years of that period.

One of the most dangerous reefs in Scotland is the Bell Rock, and so many wrecks occurred there, that in former times the good abbots of Aberbrothwick caused a float to be fixed upon the rock with a bell at the top of it, which constantly tolled as the waves swung the float about, and thus warned mariners of their danger. The circumstance, however, which led to the erection of a lighthouse on this rock was the loss of the *York* man-of-war. Merchant-vessels in numbers had been wrecked, and all their crews had perished, which was regarded as a sad casualty incidental to nautical life; but when a seventy-four gun ship was lost, with all hands on board, then the Government considered it was high time to take the matter practically in hand. Nevertheless, it was not till some years afterwards that a bill in Parliament was obtained for the erection of a lighthouse. This was finally carried into effect by Mr. Robert Stevenson, engineer; not, however, without great difficulties and delays, owing to the short time it was possible to work each day between the ebbing and flowing of the tide, and not without one very narrow escape of being lost, together with thirty workmen, in consequence of the vessel that attended them breaking adrift and the tide rising upon the rock before any boat could be got out to them. The boat only arrived just in time to rescue them all from a watery grave.

The lighthouse on the Bell Rock is 100 feet high. The door is 30 feet from the base, and the ascent to it is by means of a massive ladder of bronze. The light is revolving, and presents alternately a red light and a white light. It is produced by the revolution of a frame containing sixteen argand lamps, placed in the *foci* of large mirrors. The machinery which moves the whole in a circle is also applied to the tolling of two large bells; so that the original design of the worthy abbots is now carried out in the most regular and scientific manner. The cost of the erection of the Bell Rock Lighthouse was £61,331 9s. 2d.

Our readers will no doubt be aware that the optical construction of these lights is of the most scientific and complicated kind; and this impression will by no means be lessened, but probably increased, by an examination of the two specimens of glass lighthouse, apparatus in the Main Avenue of the ground floor of the Great Exhibition. In each of these will be observed the extraordinary results of the practical applicstion of abstract science. The complicated cutting and arrangement of the lenses is all determined by the most subtle calculations of the law of the reflection and refraction of light, as proved by unnumbered experiments, and the experience of many years of unremitting attention and labour. It is also worthy of note, that we have hitherto been dependent on foreign countries for very much of the arrangement of these optical instruments, but that, in the present instance, the materials are entirely of English produce.

Let us, however, endeavour to simplify an account of lighthouse optics. It is well known, that a lamp of the ordinary kind would send forth scattered rays, many of which would be wasted, and especially all those which shot upward into the sky. Now, the object to be obtained in this case is the concentration of the rays, and the power to throw them downwards in a given direction across the plane of the sea. For this purpose reflectors are employed: and it has been ascertained that the light thus attained is 350 times greater than that of the common lamp; while that of the largest sort, which are used in revolving lights, is 450 times greater. These reflectors are manufactured by a very long and delicate process. Those of the first class are made of fine copper, thickly plated inside with silver, and polished to the highest degree of brilliancy. The flame which illuminates them is usually derived from an argand lamp, which supplies itself with oil on the fountain principle. This system is called the "catoptric," and includes a variety of distinctions, each of which is registered, as a special signal for sailors. There is the fixed light—the revolving light—the white light—the red light—the revolving red, with two whites—the revolving white, with two reds—the intermittent light—the flashing light, &c. Of these, the most powerful and far-reaching is the white, and next to this the red. There are several optical systems in use for lighthouses, but the principal systems are the catoptric and the dioptric—the former depending upon the reflection of light, the latter upon its refraction. The dioptric is by far the more powerful, but the catoptric is more certain in its action. The former is usually preferred by lighthouse opticians, as the chances of its extinction are so very few, and its advantages so great.

Among all our finest lighthouses, there is scarcely one that surpasses the "Carlingford," on the coast of Ireland. It is 111 feet in height, 48 feet in diameter at the base, and is founded 12 feet below the surface of the water. It was designed by Mr. George Halpin. The difficulties attending a structure, the foundations of which had to be laid so deeply beneath the water, yet requiring, in common with all edifices of this kind, to be made so very strong and secure, will be readily apprehended. Great as these were, however, they were exceeded by the protracted difficulties and constant dangers attending the erection of the Skerrymore Lighthouse, in Argyllshire, which was designed and built by Mr. Alan Stevenson, Engineer to the Board of Northern Lighthouses, from whose "Treatise on Lighthouses" the following very interesting account is abstracted.

The main nucleus of the cluster of Skerrymore rocks was the only one that presented sufficient surface for the base of a lighthouse, and this had been worn as smooth as glass by the constant action of the waves, but was closely surrounded by ragged humps of rock and narrow gullies, in which the sea incessantly played in rushing coils and eddies. The cuttings for the foundation occupied nearly two entire summers. In this small space the blasting of the rocks was often attended with great danger to all the men employed in the work. The granite for the tower was quarried in the isle of Mull, where piers were also built for the shipment and landing of materials. A small vessel was fitted up for the constant use of the lighthouse during its construction. But one of the most arduous operations, second only to the main building itself, was the erection of a temporary wooden barrack on the rocks for Mr. Alan Stevenson and his workmen. It was finished in the course of the summer; but, unfortunately, a storm arose early in the winter, and swept the whole structure away, leaving no wreck to show even where it had stood, except some iron stanchions, twisted about as though they had been mere osiers, and a great timber beam which had been shaken, rent, and dashed upon the rocks, till it literally resembled a huge bunch of laths. Luckily, the engineer and his men, warned by the previous fate of those engaged on the Bell Rock, had effected their escape on the commencement of the storm. But being without a barrack, many of them, being quite unused to the sea, suffered the miseries of continuous sea sickness on board their little attendant vessel.

A second attempt was now made to erect a barrack on the rock, and this being of much stronger design, proved successful. Here Mr. Stevenson and his workmen retreated every evening after the toils of the day, or during the day when the weather was bad; but it often proved a very alarming place for repose. Perched at a height of 40 feet above the wave-beaten, in this singular abode, Mr. Stevenson and 30 workmen passed many a dismal day and night, at times when the sea absolutely prevented any one setting foot on the rocks. They longed and prayed for change of weather, not only to enable them to renew their labours, but often that they might receive needful supplies from the shore, for which they looked so anxiously and in vain. "For miles around," says Mr. Stevenson, in the book previously quoted, "nothing could be seen but white foaming breakers, and nothing heard but howling winds and lashing waves. At such seasons much of our time was spent in bed; for there alone we had effectual shelter from the winds and the spray, which searched every cranny in the walls of the barrack. Our slumbers, too, were fearfully interrupted by the sudden pouring of the sea over the roof, the rocking of the house on its pillars, and the spurting of water through the seams of the doors and windows, symptoms which to one suddenly aroused from sound sleep, recalled the appalling fate of the former barrack, which had been engulphed in the foam not twenty yards from from our dwelling, and moment seemed to summon us to a similar fate. On two occasions, in particular, those sensations were so vivid as to cause almost every one to spring out of bed; and some of the men fled from the barrack by a temporary gangway, to the more stable but less comfortable shelter afforded by the bare wall of the lighthouse tower, then unfinished, where they spent the remainder of the night in the darkness and the cold." Notwithstanding all these dangers, however, the Skerrymore Lighthouse was safely brought to completion. It is 138 feet high, 42 feet in diameter at the base, and 16 feet at the top. It contains 58,580 cubic feet of stone, being more than double the quantity of the Bell Rock, and five times that of the Eddystone. The entire cost of the Skerrymore Lighthouse, including the purchase of the attendant small vessel, and the building of a small pier and harbour for its reception, was £86,977 17s. 7d. The light is revolving, and belongs to the first order of dioptric lights, in the system of Fresnal, being of a similar kind to the dioptric apparatus now to be seen in the Great Exhibition, Main Avenue West (No. 84), near the Large Fountain.

No one, we are sure, after contemplating the two lighthouse models, to which we have referred in the course of this article, will ever again feel disposed to admit the truth of the old song, "Ye gentlemen of England," when it says "How little do they think upon the dangers of the seas." Here may he witness the constant and arduous thought of many years, to say nothing of labours and perils of life in the cause of science and humanity.

STAINED GLASS WINDOW. J. A GIBBS.

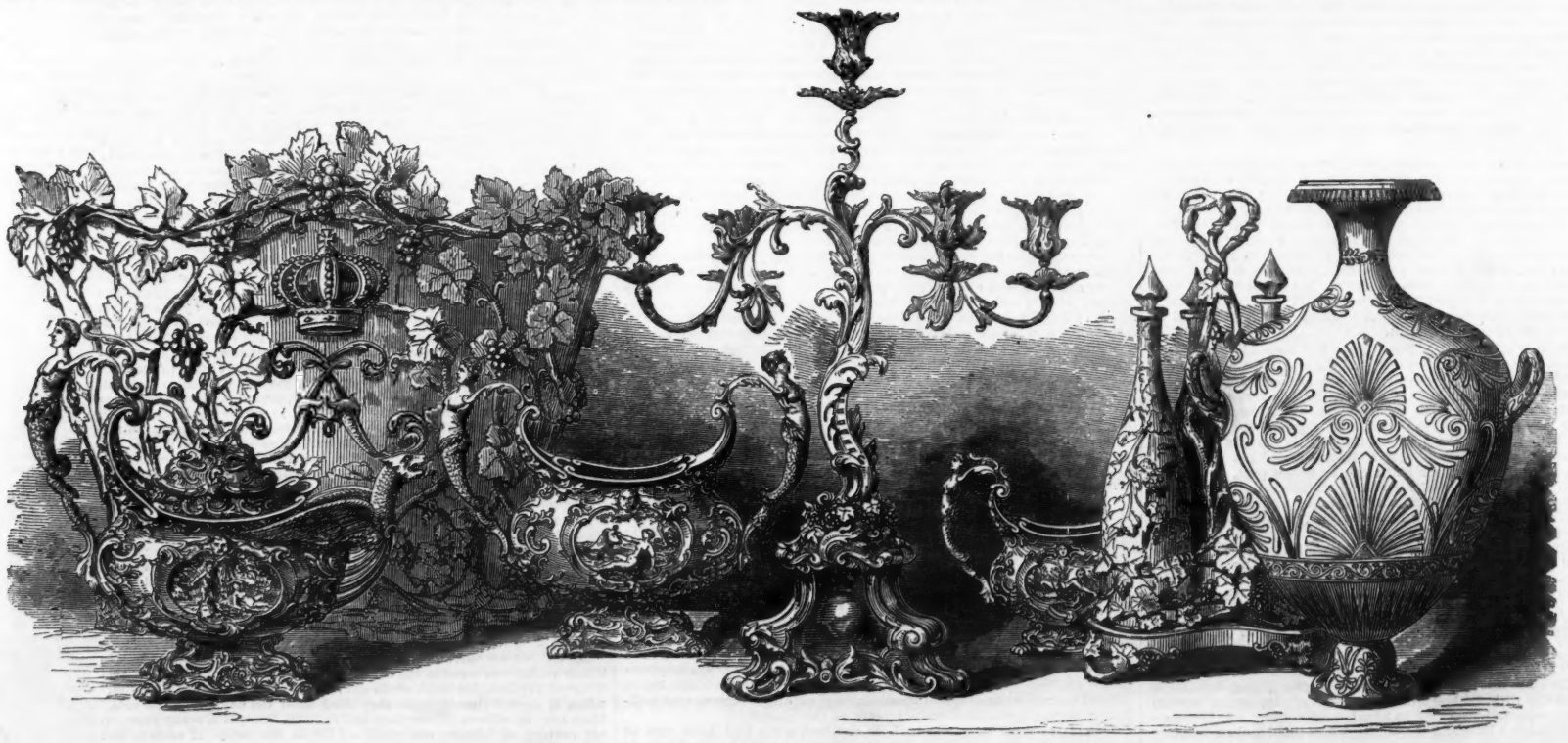
The stained glass window by Mr. Gibbs, of Newcastle, which we engrave, contains subjects illustrative of various passages in the life of St. Peter. It is in the Norman style, and consists of six geometrical forms upon a richly ornamented ruby background, embodying the principal events from the life of St. Peter. The centre medallion is Christ's charge to Peter; the others respectively contain the Angel delivering Peter from prison, Peter denying Christ, Christ calling Peter from the ship, Peter's want of faith, and in a small quatrefoil is the martyrdom of St. Peter, the whole surrounded by an elaborately worked and richly coloured border. The colours of the glass are rich and full-toned, and are judiciously combined in the work before us. It may be subject for regret, however, that, in reviving this ancient art, as a medium, it should be considered necessary to imitate the barbarous style of drawing of the Gothic ages.

ST. MICHAEL OVERTHROWING THE DRAGON.—BY M. LE SEIGNEUR.—(SEE FIRST PAGE.)

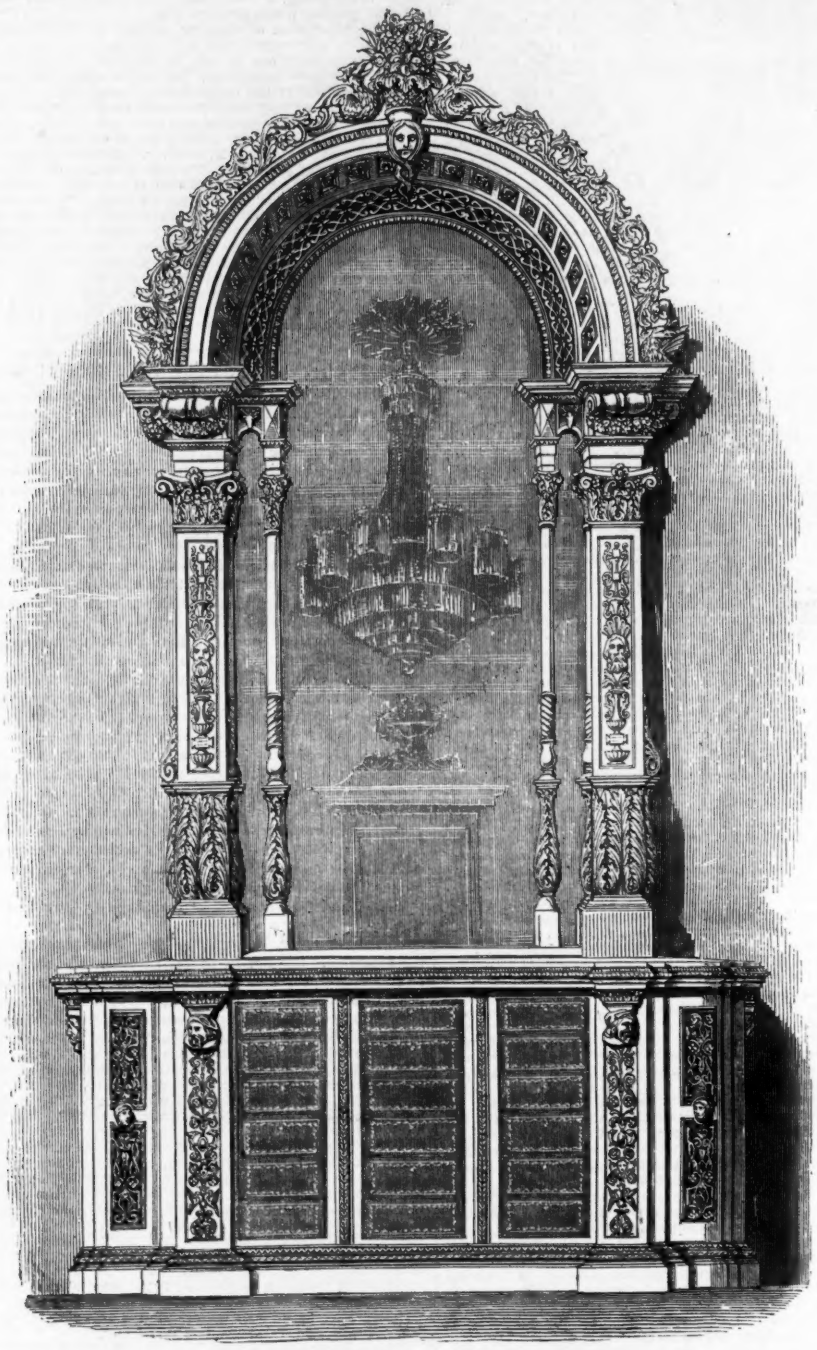
STAINED GLASS WINDOW.—BY J. A. GIBBS.

PLATE. BY HANCOCK.

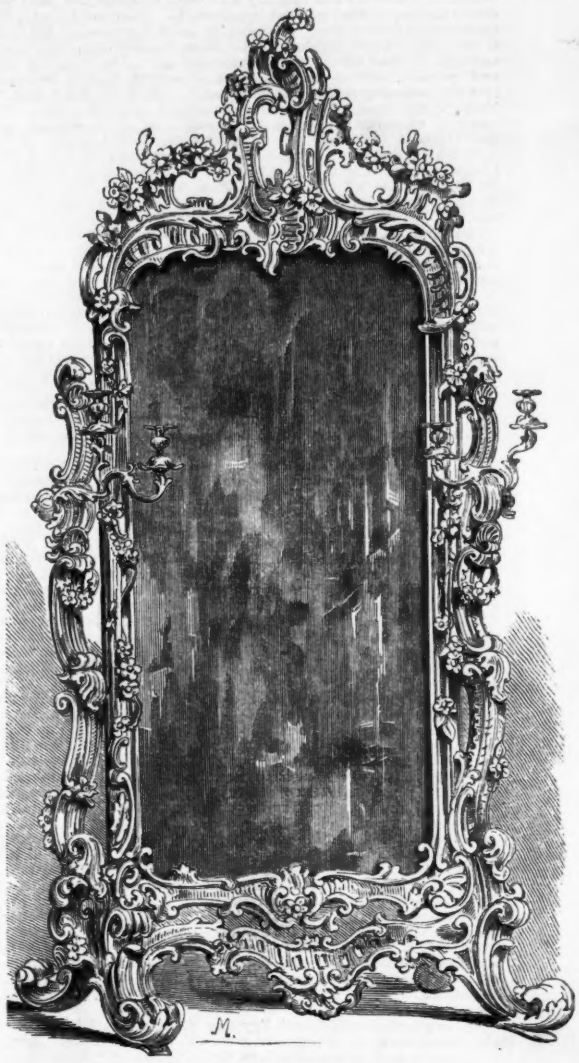
The group of plate by Hancock, which we engrave below, comprises a great variety of subjects, treated after the fashion of various periods, but all remarkable for excellence of execution. We notice a tea service in the Florentine style, a flower vase, another vase (Etruscan style), a bottle wagon, and a very handsome centre-piece.



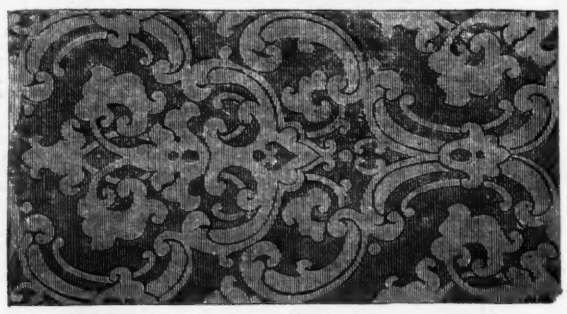
SILVER.—BY HANCOCK.



SECRETAIRE.—BY SNELL.



GLASS.—BY MESSRS. HERRING AND SON.



DAMASK.—BY HOADLEY AND PRIDIE.

SECRETAIRE. BY SNELL.

The *secrétaire* exhibited by Snell is a very handsome work of art. The form is well proportioned, and all the decorations in good taste. The chief material is walnut-wood, the inner pillars being gilt, and the basement of green stamped leather. In the door is a handsome mirror.

CHEVAL GLASS. MESSRS. HERRING AND SON.

This is a very elegant glass; the design, in the style of Louis XIV., is good, and the workmanship of the very highest character. The characteristics of the style are well-marked, and, altogether, the glass is one from its appearance, fitted for a palace.

DAMASK. HOADLEY AND PRIDIE.

We engrave one of many beautiful specimens of furniture damask, exhibited by Messrs. Hoadley and Pridie, of Halifax.

DRINKING UTENSILS.

It is a curious fact, that by no other article or series of articles in the Great Exhibition are the extremes of time—the extremes of civilisation dawning in the East and culminating in the West—so forcibly or so aptly represented as by the specimens there collected of—to casual observers—a very commonplace and insignificant article, that of drinking-cups, glasses, or vessels, and the larger jars, vases, amphoræ, or decanters in which the potable is kept, and from which it is poured into the lesser recipients. Not that we would be understood as implying that the grandeur of modern civilisation is represented by the prettynesses of cut glass or painted crockery. We have more august pleaders for our skill in the steam-engines and printing-machines, the electric telegraphs and the models of great engineering works. But, in the case of the drinking vessels in question we see both ends of the chain. Our most important works of science and invention rose, as it were, at different stages of the world's existence, from a small and slowly opening form. We trace back steam, for example, until we discern its rude and unappreciated infancy in the times which saw the "Century of Inventions." Before that period, the power, as now applied, had no existence. So of all those great achievements which most fitly represent the triumphs of mind over matter. But in the case of that small and insignificant article, the drinking-cup, we find a work of industry—in some degree, of art—which has existed from almost all time. The potter's wheel was, probably, one of the very first machines ever set in motion. It must have been coëval with the rude dawnings of the loom and the earliest applications of fire to produce and to labour iron. Man, particularly in the East, must be provided with some means of carrying water from place to place, and preventing, as far as possible, its absorption by the heat. Did the world's grey fathers live in a land of brooks and wells and rivers

BOY WITH PUNCHINELLO.—BY SIMONIS.—(SEE FIRST PAGE.)

BOY WITH BROKEN DRUM.—BY SIMONIS.—(SEE FIRST PAGE.)

vessels for preserving and drinking water out of would not have been one of the very earliest of their requirements. They could always have stretched themselves along the brink, or made a cup out of the hollow of the hand. But theirs was a land of fierce sun-glare, and sandy desert, and high, parched hills, "wherein no waters be." The fluid was scarce and precious, and so the means of preserving it and husbanding it were evidently of the first importance. Now we know that the East is the land of stagnant, changeless monotony—that ideas, customs, utensils, remain there moulded in their original form, and endowed with their original properties, during spaces of time in which, in the faster living West, the very memory of races and dynasties becomes extinct. What do we know of the pottery of our Saxon forefathers, or at all events of the art as practised, if it was practised, by the savage aborigines of the land? In Asia, on the contrary, what was, is. The Hindoo of the present day forms his household implements, his jars and his cups, in the fashion of those figuring upon tombs and temples which were ancient when the Macedonian phalanx scattered the native warriors. In western Asia, the Bedouin still straps to his own or his camel's neck the porous bottle, which may be seen represented in the *bas reliefs* dug up from Nineveh. In Egypt the fellah drinks from the earthen vase, the like whereof has been emblazoned by painters who owed allegiance to the Pharaohs. As, therefore, an interesting, although not a very varied collection of Eastern drinking and fluid-holding vessels has been got together, and as they are precisely the same shapes, formed in the same way, and of the same materials, as the cups and vases in use perhaps 3000 years ago, we are enabled to contrast these appurtenances of the earliest social development of the human race with the cups and saucers in which we consume the last importation of bohea, and the decanters and bottles by the genial aid of which we drink "success to the Exhibition."

The three departments in which the rude pottery of the East is collected in a greater or lesser degree are those of India (a rich museum of rude vessels), of Tunis, and of Turkey. The first thing, perhaps, which strikes a visitor in the aspect of these grey, coarse vases, after he has observed their primitive simplicity of form, is, that they are the very counterparts of the vessels commonly represented in Scriptural illustrations as borne upon the heads of Eastern maidens resorting to the well. Vernet's wonderful Oriental pictures, glaring with the very mirage of the desert, rise instinctively to the mental eye. We think of the shady group of graceful palms and dates, and the broad thorny leaves of clustering cacti. The sun is at its highest, glaring over the long horizontal lines of the white expanding desert, the distant horizon quivering and wavering in the heat like the extreme sight line of a stormy sea. But in the oasis there is shade and shelter. The desert spring has nourished a little patch of herbage, for the steed of the Bedouin and the camel of the pilgrim. Tents have therefore been pitched hard by. You see their white or striped canvas gleaming through the graceful feathery leaves of the date palm. Beyond, perhaps, stretching their patient faces in the direction of the running water, the string of camels kneeling in the sand awaits their well-won refreshment; while by the well stand grouped a cluster of those loosely-robed and picturesque Orientals, the men turbaned and black-bearded, dignified of aspect and stern of speech; the women, with their unbending carriage and stately stept, heir bronzed and symmetrical features, and their narrow almond eyes, bearing either upon their heads, or on their shoulders, as Rebecca did when she gave Abraham's servant to drink, or Rachel, when she met her uncle by the fountain; the pitchers or vases, big-bellied and narrow-necked, perfectly simple and rude in construction, yet not without the instinctive feeling for beauty of form which exists in all the higher organizations of unsophisticated man—pitchers and vases exactly resembling those before us, which, constructed by some potter of the wilderness, according to the traditions of the craft handed down from the infancy of time, have found their way to Europe to speak to us with a sweet and solemn voice of the old time of the biblical nomadic tribes—of the patriarchs, with their flocks and their herds—of the ancient cities and ancient kingdom of that awful, solemn, mysterious, and changeless East.

Pausing in the Turkish and Egyptian departments, let us examine closely a group of these primitive vessels. We observe that they are all capacious and narrow-necked, so that the risk of spilling may be lessened, and the drying air have as little scope as possible to operate upon the fluid. This shape also gives convenience for locomotion; the vases may be easily carried to and fro, slung round the neck, or to a horse's or a camel's trappings. In one set of the largest class of vases, evidently intended to be the family reservoir in the hut or beneath the tent, there is, besides the larger aperture at the top of the neck, a second but much smaller one, spout-shaped, on the tea-pot principle. The pitcher is evidently intended to be filled by the larger opening, and its contents doled out afterwards by the tiny orifice of the spout. The mouths of some of these larger vases are supplied with covering made in the shape of, and evidently intended to represent the ordinary Oriental summit of the minaret. The workmanship of all these vessels is very rude. They are seldom or never truly circular, and the clay is full of bulges and inequalities, but still the general grace and beauty of the form aimed at, if not attained, is undeniable. That form, indeed, contains the rudiments of all the ornamental vases that the world has seen. The germ of the Etrurian art was no doubt Eastern, and in the glittering displays of the Bohemian art manufactures, in the shape of the porcelains from Sèvres, and the less artistic, but still promising produce of our own pottery districts, we recognise at once that principle of art and that theory of design which the East originated, and which the West developed and perfected. The Indian vases and drinking vessels, although exhibiting far more constructive skill, are generally, we think, inferior in point of beauty and design to the more western portion of Asia. You see amongst the former a great number of jugs of not the slightest pretence to shapeliness; belonging, in fact, to the same high school of art-manufacture as that which produced our own pickle-jars and blacking-bottles. In the Arabic and Syrian vessels, on the contrary, the effort at a graceful line of beauty is all but invariable. The Indian collection shows many vessels of nearly the same design and shape as our common decanter; and it will be observed that the vessels in general are by no means so well adapted for locomotion as the other class which we have described. In the Indian collection, too, we see a far greater distinction in the apparent costliness and elaboration of certain of the specimens. The Arab Sheikh drinks his lukewarm draught from the same bottle of porous earth as the tent-pitcher or the camel-driver. Not so the Rajah or the Nabob. He has his gaily ornamented pitcher worked into fantastic shapes, or enamelled, and, as it were, embroidered with gay-coloured patterns. The collection of these ornamented cups is considerable. The decorations seldom or never appeal to anything like a real sense of art or beauty. They are thoroughly barbaresque, like all Indian ornaments; mere prettiness in the disposition of the colours, and mere ingenuity in the construction of the patterns being alone attended to. In this respect, indeed, the general nature of the Indian exhibition is well worthy of consideration. The same principle will be found to prevail universally in her art manufactures. They are rich—gorgeously rich—and often well wrought, showing the possession of great mechanical skill, and of a splendid mine of precious raw material. But the Indian artist is nothing without a glittering or a precious substance to work on. He has no notion of the abstract and highly ideal beauty which can be produced from the simplest combination of flowing lines, constructed, it may be, out of the basest or paltriest material. His ingenuity, which is great—witness his weapons—is unassociated with art. He can be dazzling and surprising; he can construct marvels of neat-handed cleverness; and, his material generally being valuable and glittering—gold, diamonds, and precious gems, to wit—he gets a vast deal more credit from the ordinary run of people than he is entitled to. Thus, in fact, India seems to stand artistically, as it does geographically, between China—in which ingenuity without art is brought to its perfection—and the belt of the world inhabited by the Arabic races, in which art, or, at all events, the germ of art, is to be found uncombined with ingenuity; but which, introduced to the western world—being there appreciated and there finding the necessary manipulative skill to give it development and elaboration—has given birth to the most perfect specimens of artistic production in the marbles of Greece and the succeeding marvels of Italian art. Thus we see, in the case of the articles in question, the jugs, vases, and pitchers which we are considering, the simple grace of the original Arabic works lost in the better manufacture of the Indian articles; and presently, too, we observe another very characteristic indication. The vessels from western Asia are uniformly made of coarse clay. Those produced in India are made of different clays and burnt-ware; and at length we find the earthenware giving place to metal, to brass, or some such composition, the old clay shapes being faithfully represented in the new metallic substitutions. It may be a prejudice grounded upon no sound principle of art or reason; but the vase, at all events in its more ornamental and artistic developement, has been so constantly fashioned of potter's earth, that we regard vessels of the same design made in glittering sounding metal as something essentially barbaresque and artistically incongruous. Compare, for example, the pitchers and bottles in Tunis and Egypt with the tribe of brazen cups and decanters in the Indian compartment, and answer whether the latter—although industrially and mechanically before the former—are not artistically as much behind them. This remark is not meant to apply to the hammered-out brazen pitchers, with spouts, to be seen in Tunis. These articles are exceedingly rude and exceedingly interesting, but they do not belong to the category with which we have been dealing.

From the ancient world, then, to the modern—from the patriarchal vase to the "big-bellied bottle"—from the original of the amphora, which held Falernian, to the modern decanter or claret jug, ruddy with the vintages of Oporto, or the more delicate liquid of "fair Guienne."

The display of English cut glass and crystal, in the gallery abutting the west side of the Transept, is an exceedingly beautiful and creditable one. Our cut glass, we are inclined to think, beats all competition. Bohemia colours to perfection—but we cut. There are specimens of glass in the gallery in question which sparkle just as brightly, and look just as well, as the Koh-i-noor. Indeed, Mr. Apsley Pellatt exhibits a collection of imitation diamonds, which are not one whit less beautiful or transparent than their originals, while the prisms, with their glancing colours, are more exquisite objects than the most costly and most radiant gems ever dug from the mine. It is with glass, however, in its fluid-holding shapes that we have now to do. Let us examine with care one of these beautiful and fragile trophies of piled-up sparkling crystal, and see what advances we seem to be making in the most glittering and most artistic garniture of our tables.

And first the decanters. The general tide of improvement seems to be setting strongly in the way of making these more and more richly and elaborately adorned, and massive. Many of the specimens before us are beautifully symmetrical masses of carven and glistening glass, the substance rising in crystal lumps and projections of vast massiveness to the hand. In the formation of these—principally intended for port and sherry—the circular shape has been considerably broken in upon, the decanters being many-sided, and the square and rigid lines of the cut embellishments harmonising with the geometrical-like figure and fabric of the whole. There is little of the pure sense of beauty in these vessels. They convey the idea not so much of grace as a handsome massiveness, and a rich and bold solidity; but they are certainly immense improvements upon the old-fashioned decanters which still linger in houses long ago furnished, and in retired districts of the country—decanters formed of a mere thinly-blown bell of glass, conveying an idea of intense fragility, and without the slightest pretensions to any thing but the most commonplace prettiness of form, the single ornament of the belly part of the affair generally consisting of a range of narrow-bladed leaves or imitation grass growing up from the bottom of the vessel. In the decanters principally intended for claret and the lighter wines, we observe two prevailing forms, the jug shape and the bottle shape. The former is the more vase-like, and perhaps the more graceful; the latter is frequently the more elaborately ornamented with cut and sparkling glass, and in its general shape bears no slight resemblance to our old friends the porous bottle of the desert.

In the vase-shaped claret jug there are two features which greatly take off from the symmetry of the article—a handle upon one sideof the neck only, and a stopper in the mouth. In the pure vase, all such appendages as handles must of course always be duplicate, and the curve of the projecting lip for pouring forth the wine is no compensation for the want of the twin proportion which the eye demands. The stopper is another drawback upon this attempt to devote the vase shape to after-dinner uses. Crowning the pure curve of the neck and swell of the vessel with its impertinent and inconsistent protection of square cut-glass, it shows like a cocked hat upon the head of an antique statue. The other—the bottle form of the claret decanter—if it possesses less of the element of the line of beauty, is also free from the inconsistencies and palpable objections attaching to its rival. The eye is not caught and offended by the one-sided appearance communicated by a single handle; while the stopper, if handsomely designed, sets off the long neck, forming, in fact, the capital of the column. However much, however, we may be improving the shape of our decanters, we fear it must be owned that we are decreasing their capacities. In this respect, at all events, we are degenerate. We see no magnum holding a couple of quarts, the regular old receptable for claret. The reign of the still more capacious vessels, of the order of the "Black Bears" and the "Tappit Hens," celebrated in "Waverly," has been long over; and now-a-days no glass-blower would dream of constructing a vessel which would hold more than a quart, however ready he would be to fashion one which held less. Some difference in the design of bottles for light and strong strong and wines would, however, be appropriate, and have a consistency in the very nature and harmony of things. We have small liqueur glasses for the fiery or surfeiting liquid, and larger drinking machines for the less strong and pungent wine. Why not carry out the principle, and by the size of our bottles indicate to the toper that claret is lighter than port, and that he is fairly entitled, consistently with his sobriety, to imbibe two glasses of the first for one of the last?

The water jugs or carafes, we perceive, are generally formed after the fashion of the vase claret jug, the greater width of the neck indicating that the liquid contained is more common, and that it may be poured freely forth. The appropriate ornaments are almost always water plants, and leaves frosted in the clear glass. The article, however, is one in which there is still room for improvement and advance in grace and elegance. The absence of the necessity for a stopper, and for an unduly small neck, presents facilities to the artist who devotes himself to the task of improving those humble but necessary ornaments of the toilet and the table. One or two specimens of "Anglo-Venetian frosted glasses," made in imitation of the celebrated *moyen age* manufacture of the Adriatic, may be inspected with pleasure. There is nothing very graceful about the forms of the jugs, but the effect sought to be produced is that of massive solidity and weight, while the peculiar and lumpy character of the dimmed and frosted glass gives the appearance of ice to the utensils—suggesting associations of coolness, which, perhaps, to some degree re-act upon the fluids contained in them.

As decanters have been gradually becoming heavier, more squarely built, and more elaborate, the precisely opposite taste has been gradually gaining ground as respects glasses, which are daily becoming slimmer in the stem, less ornamented at the bulge of the bell, and thinner, with a tendency to simple roundness of form, in the holding part. They were, many of them, great monstrosities, the common run of glasses formerly in use. Who does not remember the old-fashioned thick-stemmed, gouty, dropsical-looking affair commonly known as a tavern glass? It was the very incarnation of clumsy ugliness, but it had its good points; it was made for rough work, and it stood it. A fall or an overset was of hardly more consequence than it would have been had the material been malleable. Increased liability to breakage, we fear, is one of the penalties we must pay for advancing grace and beauty in glasses. The slim and elegant claret glasses now made, with a bell like a transparent bubble, and a stem like a fairy column, will and must smash almost with the fillip of a finger. But all minute and graceful objects of art must of necessity be tenderly handled. There is an element of beauty in their aërial lightness, which, as it gives pleasure, demands care. Generally, then, we think that the glass manufacturers are on the right road, for, as regards so small an article, the lighter and the more gracefully aërial they can make it look, the greater will be the triumph. The old-fashioned long and slender champagne glass seems to be giving way rapidly before its new-fangled rival—the open saucer-like affair perched upon the top of a thin straight stem; and the reason of the change is a very obvious phenomenon. In highly-flavoured and effervescing wines no small part of the pleasure of consumption arises from the discharge of the perfumed gas with which the fluid is charged being inhaled and appreciated by the olfactory nerves while in the act of drinking: now, in the shallow saucer-glasses the discharge takes place with great rapidity and power, in consequence of the breadth of the surface of the liquid brought into contact with the air, a phenomenon which only occurred to a very limited extent in the long narrow tube-like glass. So well was this fact known, that champagne merchants and dealers, before the general employment of the flat glass, used to have special private tasting-glasses made for their own use, by the help of which they estimated the quality of the wine submitted to them, and fixed its money value. Some of the tasting-glasses which we have seen are furnished with a bottom of silver, so as to enable the experimenter the better to judge of the colour and clearness of the wine. The drawbacks to this species of glass are, that it is by no means so elegantly symmetrical as the old-fashioned form, and that it is not so convenient to drink out of, for reasons which will be appreciated by every man who ever sipped his tea out of a saucer.

We were gratified by observing that the tribe of coloured glasses did not show in any strength. There is no more stupid abomination in the range of fluid-holding and quaffing vessels, than these same stained glasses. They were brought into fashion from Germany, and generally employed in the consumption of German wines; but, unless they were invented by some knowing and rascally wine-merchant, who wished to conceal the bad colour of his decoctions, we cannot conceive how they could have originated at all. The hue or tinge of the glass has no pretensions to beauty or brightness. It has, therefore, no intrinsic qualities to recommend it, but simply serves as a means of destroying one of the most refined pleasures of the experienced wine-drinker—the contemplation of the depth and richness of the colour of the wine. Take a common green hock glass, and stare through it. The bowl may contain either tea or claret—ditch-water or Johannisberg. We would not have the "sunset glow" of Burgundy, or the no less beautiful and delicate varieties of tinge of other precious wines, so trifled with.

In the department of drinking pottery—in other words, of tea-cups and saucers, and common jugs and mugs used by the working classes, we see little which can be said to be novel or remarkable. No new shapes have been introduced, the improvements visible being almost entirely confined to the department of ornamenting with gilding and colouring. Many very beautiful sets of china and porcelain tea services are shown, the paintings done with taste and neatness of hand, and the arrangement of the colours pleasing and symmetrical. A peculiarity in this part of our Exhibition is, however, a childish triviality which ought to be scouted and put down. The exhibitors seem to have worked their wits for the invention and production of new and anomalous shades of colour, which they christen "Queen's colours," "Sutherland colours," and so forth. Now, we have quite enough of colours already. A porcelain painter, or any other painter, if he cannot produce an effect with the colours of the rainbow, may as well give up the brush, and betake himself to some other trade. Colours are only tools—only means to an end; and the artist who goes on multiplying his tools without increasing his knowledge or his dexterity in using them, is like the man who thinks he could make better and more skilful work if he had a greater number of hands and fingers to employ upon it.

THE CONTRIBUTIONS FROM TURKEY.

In consequence of the total and unaccountable absence of any Catalogue, either general or special, of the Turkish contributions in the various publications enumerating the contents of the Crystal Palace, this department, so replete with interest, has excited much less attention than it merits. Apart altogether from its intrinsic worth, is, moreover, the interest naturally attaching to the industry and productions of an empire the condition of which must always be regarded by the Englishman as of vital importance. Turkey justly looks to Great Britain as one of the foremost, the sincerest, and the most potent of her allies and friends; while Great Britain cannot feel indifferent to all that illustrates the internal condition of an empire that fills up so much of the vast space intervening between our Indian dominions and the central countries of Europe—an empire which includes within her territory the mouths of the Euphrates and the shores of the Persian Gulf on the one hand, and on the other divides with Austria the kingdom of Croatia.

In complete contrast to the wonderful extent and variety of the raw products of our colonies are those of Turkish industry; for in many of them we distinctly recognise a closer analogy to what the ancients have left behind us of their domestic manners than can be discovered even in modern Italy; for, while the revival in the fifteenth, sixteenth, and seventeenth centuries completely modified Italian manners, much of the ancient forms found by the Moslems in the countries which they conquered have been left with little alteration. Of this no one can doubt who looks at the collection in question, from the brass lamp with its scissors, pincers, and bodkin, to the arabesque plaster moulding and other slightly altered traditions of the world, of which the excavations of Pompeii have given no such interesting glimpses.

But it is not the conquerors of the Empire of the East that entwine themselves with our modern sympathies. Gibbon, with all his rhetorical splendour, illumines, but does not vivify the Amrus, the Saladius, and the Amuraths. Uhland, in one of his most exquisite sonnets ("Kaiser und Dichter"), contrasts the duration of the conquests of princes and bards; and all must agree with him, who visit this collection, and think less of those who trod over great monarchies than of those who depicted the manners and superstitions of the Orientals. Not one in a hundred of those who visit these interesting collections, remembers that three centuries ago all Europe quaked with terror at the name of the Grand Turk, and that Solyman the Magnificent was an even more powerful Sovereign than Charles V.; but all remember, and none ever will forget, the heroes and heroines of the "Arabian Nights Entertainments." The Ottoman Empire is now an essential part of the "grand tour;" and, therefore, many who pace the Crystal Palace have comparatively little new to see in the Turkish department! but these few form, after all, an insignificant portion of the hundreds of thousands who have never seen either the Black Sea or the White Sea, the desert, or the palm grove; but are, nevertheless, familiar with the sayings and doings of the guarded city of Bagdad, from the street-porter with his weary burthern, to the Caliph himself, attended by Jiafar the Barmecide and the redoubtable Mesrour-el-Siaf. It is, therefore the latter portion of our fellow-countrymen that we invite to accompany us in a tour through the objects on the tables and in the stalls which have been contributed by all parts of the Ottoman Empire. The great merit of such works as Russell's "Aleppo" and Lane's "Modern Egyptians" is their truthfulness; still more instructive, therefore, is the presence of the objects themselves.

Household utensils are here in great abundance, and fill up a large space in the contributions. The usual beverage in the East is coffee, presented without milk or sugar at every visit, so that it is drunk a dozen times a day, and, in order to avoid inconvenience, not only are the cups very small, but partially filled; here, therefore, are a great variety of coffee-cup holders, in form resembling our egg-cup, which are usually of metal, the best being of silver filagree of great fineness; others are carved wood, some of them of the cocoa-nut, cut with great neatness. These are to be seen in glass cases; and in the pavilion within are embroidered cloth coverings, with which the tray is brought in in good houses.

Prominent in the centre of the tables is a large machine of glittering brass and of elegant form, that looks like a huge tea-urn. This is a mangal or brazier, for charcoal, with which apartments are heated in winter. People in England may abuse our climate as they choose, but they may rest assured that in many respects it is not easy to find a better, for we are neither roasted in summer nor frozen in winter; and at Christmas time recommend us to the sun of Wall's End or Newcastle-upon-Tyne, which blazes in every snugly carpetted English parlour, to the charcoal of the most elegant mangal that ever was constructed. *Punch* is right, the black diamond is certainly the real mountain of both light and heat. The mangal stands in the centre of the room, and a coverlet being thrown over it, the ladies of the hareem sit around it in a circle, and thus warm themselves in a manner not the most healthy or improving to the complexion. Beside the mangals are the basins and ewers, such as are used for washing before and after food—the servant holding the former in his left hand, while the water is poured out with his right. Here, too, are sherbet cups, the Bohemian practice of gilding stained glass having been originally borrowed from the East; and we need scarcely say that the European offspring excels by a long way the Oriental parent. But those shown at the Exhibition are creditable to the manufactory of Ingekyoi. It is climate that suggests the quality of diluents; and while the North is cunning in the distillation of strong liquors, the South is equally remarkable for the ingenuity with which cooling drinks are compounded, from the choice lemonade and orgeat to the delicious chopped ice sherbet with the orange-flower flavour. Let it not be supposed that it is only in idleness and in the arts of pleasing that the ladies of the East pass their time; here, to be sure, are ingenious cosmetic boxes, with various compartments for the different dyes used in adornment: they are equally skilled in the useful and domestic arts, and the ladies of the highest rank are acquainted with the art of preparing such drinks. In that of preserving fruits they even excel our own housewifes, and a very large mother-o'pearl frame for embroidery reminds us that the most beautiful dresses of the wealthiest classes are the product not of the professed milliner, but of the domestic hareem.

The military character of the Turks is sufficiently recognisable in the collection, many objects showing them to be essentially a nation that mounts much on horseback, lives much under tents, and has adapted its habits to military locomotion. Every one who has lived in a Turkish camp, or has seen how easily Turkish troops are moved, is impressed with the adaptation of their habits to this phase of life. It would take too much space to enumerate the articles illustrative of this part of our subject their camp dishes fitting into each other and easily portable, their lanterns that shut up and open out like magic, and many other articles, show that with the Orientals there is not, as with the European, that broad line of distinction between the habits of residence and the habits of locomotion that exists in the West. It is not merely the aboriginal and nomade habits that account for this, there is a political reason: the constant fear of the great dignitaries of the empire acquiring a formidable local influence, causes a perpetual circle of

recalls and nominations in order to maintain in efficiency the functions of the central Government; this produces a great deal of movement from one end of the empire to the other on the part of those dignitaries, military and civil, who in the Ottoman Empire stand in the place of a hereditary aristocracy. Thus, whatever is portable, whether diamonds, carpets, or shawls, is prized; hence, too, the expensive velvet, and gold embroidery bestowed on their saddles. And instead of such ponderous fixtures as the European writing-desk, the pianoforte, and the organ, there is the diminutive cocoa-nut, or brass inkstand and pens for the hours of business, or for the hours of diversion there is the light reed *nay* or flute, the lute, or the violin, of the most primitive construction, such as one sees in the productions of the very early Italian painters.

But we are getting into the inextricable slough of philosophy, instead of proceeding with our catalogue *raisonné* of the different objects. An examination of the collection of beads will repay trouble—the habit of passing beads through the fingers being as inveterate with many Turks as the perpetual wood-whittling of a Kentucky man; we have even known an individual who weaned himself from this practice, and yet never met another person with beads without being unable to resist the old temptation, and beg for them to pass through his fingers.

Fez's, from Tunis and Egypt there are in abundance, and also plenty of stuffs for wrapping round them hanging in various parts of the collection, from simple cotton to fine shawl; but we saw no regularly wound and made up turban, such as is worn in the East, but a not uninteresting substitute is one of stone or plaster, such as usually adorn the cemeteries of the Tureks.

The water-pipes are uncommonly beautiful, we mean those in which Bagdad timback is smoked through snake-formed tubes, and which from the noise produced by the passage of the air through the water is commonly called the hubble-bubble. In those vases and in the snakes will be found a skilful attention to effects of colour; and if we pass to other objects, such as dresses, shawls, scarfs, girdles, we may remark that the suitableness of very bright and contrasted colours to these warmer climates, springs from the semi-obscurity of apartments partially darkened to exclude the heat and light of the sun. It was the Venetians that most fully understood this phase of the beautiful. Hence, in consequence of the limpid depth of his shadows, the boldest colours of Paul Veronese never shock us, which is certainly more than can be said of Rubens with all his genius and facility; and this peculiar quality of the Venetian school could never be attained by northern painters living in climates where every effort is made to get as much of the sun as possible, nor by any set of men whose eyes are not educated to the effect of brilliant colours in every variety of sombre shadow. From tracing the connexion of Venice with the manufactures of the Levant, so frequently introduced into the Venetian pictures; the observation of the relation of the Levant to the arts of Italy cannot be considered as a *baroque* transition, and those who take an interest in the old pottery of Faenza may remark the prevalence of that Faenza-like green and yellow in the rude pottery of Tunis.

Such observations are made for the many who pay their shilling, and not for the season-ticket holders, who have lounged up and down the Levant, and may have made such remarks for themselves; but even to the *homme blasé*, in relation to Oriental life, there is much to fix attention. A jar of dates is a jar of dates, but certainly a common jar of Barbary dates has not the same interest for us as one from Medina, grown under the aëronautical sarcophagus of the prophet himself. One jar of curdled milk is like another; but when we know that the one before us is that of an African ostrich, it ceases to be common milk.

"Would you like to give a guinea for one of those spoons?" said a friend, who conducted us through this portion of the Exhibition.

"We should be very sorry."

"Well, then there is one that you cannot have for less than £30 sterling."

We saw that it was not of tortoise-shell nor of ivory, but something of excessively fine texture, between the two, and learned that it was a beak of the spoon-bill heron, a bird now so rare that it promises to become at no distant date as extinct as the *Megatherium* or the *Ichthyosaurus*. Even the specimens of ingenuity degenerating into the *baroque* are not without interest: here is a wooden chain, each link perfect without a joining, and cut out of one piece of wood, a piece of most laborious handicraft. On seeing a shirt almost stiff with gold-lace, we are reminded of the quaint pages of Southey's "Doctor," who, on reading of some man who had a shirt of gold and a shirt of silver-thread, declared his preference for the perhaps unkingly but more comfortable nether garment of Flanders linen. And much as we have praised the Turkish aptitude for the portable, it was scarcely without a smile that we passed the odd combination of a chibouque and the crutch of an invalid. We have heard of a book called the "Pipe of Repose," and felt amused on seeing the thing itself in the shape of an article capable of doing duty in both capacities.

But it is not merely the gratification of a fastidious curiosity that renders a visit to the Turkish collection attractive; it is in fact the best and most interesting lesson in physical and commercial geography, in relation to so large a part of the world, that has been hitherto offered in this metropolis. Turkey has neither the scattered colonies, such as the British empire, nor has she the vast extent of territory possessed by Russia; but no state in the world is, to use a German phrase, so many sided, or presents such contrasts of productions and manners in consequence of the diversities of her nations and climates; and her vast contiguous territory is rather ruled by Turks than thickly settled by them, for they are rather the conquerors than the colonists of the wide territories stretching from the Caucasus to Algeria, from the Adriatic to the Persian Gulf. Most travellers dilate very largely on the vices and corruptions of the Turkish administration of the various departments of government; but it cannot be denied, that, although the march of government is less regular than in Europe, the State itself is without the burthen of a national debt; that the internal taxation, although somewhat arbitrary in application, is, upon the whole, very light. The principal cause of this is the very large revenue which she derives from a scale of Customs duties fixed upon solely with a view to revenue, and not adapted to produce an artificial scarcity favourable to the few who have to sell a particular commodity, and injurious to the general interests.

We usually associate the Ottoman dominions with heat rather than with cold; but there stands an elegant sledge from Jassy, the capital of Moldavia, which shows not only the love of luxury in the boyars of that principality, but reminds us that Russian vicinity has imprinted Russian manners on a part of the Ottoman empire, which, from its level plains and severe winter, in no way belongs to the East as sung by the Byrons, Goethes, and Moores, and which, if it has neither the azure skies of summer climes, has, throughout the length and breadth of its territory, the thick rich alluvial soil which makes the plains of the north of the Black Sea a granary of all Europe, and procures for the boyars of those principalities incomes far exceeding those of the average of the impoverished *noblesse* of the continent of Europe. We therefore see that the manufactures of those parts spring from their economical circumstances; they have neither silks nor velvets, but their wax-lights and other modifications of native productions surprise by their cheapness.

If we cross the Danube into Turkey in Europe, we see in this Exposition comparatively little to remind us that Ternovo, a city of Bulgaria, was, at the end of last century, one of the most active manufacturing towns in Europe. But we find in Turkey much the same phenomenon as in India—the immensity of British capital and machinery has swallowed up the smaller industries, as the large fishes eat the small, and the 2000 looms of Ternovo have fallen down to a mere remnant. The Turkish Exposition is, therefore, less remarkable for its manufactures than for those articles in which we see patient and ingenious handicraft exercised upon manufactures, such as the embroidery of female articles of dress, among which we may specify gold upon a light blue ground, silk of various colours worked upon white muslin, and the winter-dresses, remarkable for their elegance, the best combination of which is black silk upon a chocolate ground.

In Albania, that land of mountain warfare, it were vain to expect the results of either capital or machinery. The turbulent character of the population is brought to our observation by the excessive elaborateness of their rifles and pistols, which are as much an object with a wealthy Albanian as a horse to an Arab, or a carriage and a box at the French theatre to the boyar of the principalities.

In the vast plains of Roumelia, we see signs of a climate more genial than that of the principalities, and of a population less turbulent than that of Albania. The sight of the cotton and tobacco of Macedonia is pleasantly relieved by the fragrant odour of otto of roses from Kasanlik. The heavy articles of export are not so much from the capital itself as from Salonika, Smyrna, and other ports. The capital is the receptacle of a large mass of British, French, and Austrian manufactures, annually exported to Turkey, but it is at these other ports that vessels seek their return cargoes.

As a place of manufacture, Constantinople itself is a sort of Paris to the Eastern world, and productive rather of the diversified objects of luxuriant convenience adapted to Eastern usages than of articles of first necessity, which recommend themselves by cheapness and general use. For instance, the cymbals of our military band were originally introduced from the East, which is shewn by the habit of the cymbal players in various European armies still wearing an Oriental costume; and we are amused on seeing an English inscription, rudely engraved on a pair, which runs as follows:—"This sort of zieh was invented by Mr. Kevork, A.D. 1730; and the present has been manufactured by his grandson's grandson, Mr. Kirkov, A.D. 1851. Psamatia, Constantinople."

Let us now, after contemplating the very neat model of a Bosphorus kaik cross this marvellous and beautiful river of salt-water, flowing between its umbrageous banks to the Sea of Marmora, and occupy ourselves with the Asiatic portion of the Ottoman contributions, which is still more highly favoured by climate, richer in classical associations, not less remarkable for natural capabilities, having mineral and agricultural wealth—much of it, alas, too dormant considering its advantages!—being bordered with most excellent ports from Trebizond and Samsoun round to Marmorice, and other ports on her southern coast, which everywhere present themselves to facilitate communication. Here is the copper of the mines of Tokat; here is the excellent sword cutlery of Adana; here is the wealth of the waters of the Archipelago, the sponge torn up from the depths of the Mediterranean by the boldness and ingenuity of the diver, with the still adhering oyster; here is the large black wheat of Konich, that ancient capital of Turkish power, long before the sons of Orchan became the terror of Europe; and here, too, are those large and excellent Turkey carpets, which stand their ground so successfully against the skill and capital of our own Kidderminster.

Our article is already beginning to become very long; we must therefore, make haste to cross the Taurus, and get into Syria, which has much to interest both in the way of natural productions and manufactures. The tobacco of Latakia is still beyond all comparison the best either of the New or the Old World; for no American tobacco is in delicacy of flavour equal to that grown in the mountains between Tripoli and this place. The silks of Mount Lebanon and of Broussa, in Asia Minor, are also put together, and are well worthy of an examination. The silk of Syria has been until lately unsuited for exportation to England, in consequence of its being long reel; but, latterly, by the exertions of Messrs. Portalis, a French merchant in Beyrout, and of the active and ingenious Messrs. Barker, of Aleppo, sons of our late well-known Consul-General in Egypt, manufactories, with improved machinery, have been established by the former firm in Mount Lebanon, and by the latter gentlemen at Suediah, near the mouths of the Orontes, with such results as to leave no doubt of the advantages likely to accrue from an extension of British capital in this direction.

If we pass from the coast to the interior, the great cities of Damascus and Aleppo arrest our attention by their manufactures of mixed silk, cotton, and gold thread, which are equally remarkable for their richness, their elegance, and their substantial strength, being universally used for the holiday dresses of the inhabitants of those countries; the ingenuity and machinery of France and England having produced no successful imitation, these native manufactures, along with those of silk sashes for turbans and girdles at Tripoli (Syria), still continue to vegetate, although certainly in a decayed condition. In Aleppo this manufacture is mostly in the hands of the Christians, the shameful plunder and outrage of whom last year, by the fanatical Moslems being a blow from which it will be long before they recover. Of other manufactures, the saddle from Damascus is characteristic of the country, but does not give a favourable idea of the ingenuity of the Damascenes. What a European most prizes is their excellent preserved fruit, the whole territory that surrounds the town being one vast orchard, intersected by the seven-armed Barrada; while the principal art and handicraft of the place—which is that of mosaic pavements, the beauty of which strikes all strangers—is not of a nature offering capability of being shown in an Exhibition such as we describe.

As for Arabia—that waterless land of stones, sand, camels, and starved shrubs—so lacking in corn, wine, and oil—so contrasting to Egypt with her flesh-pots, and fertile rather in rhymes and metaphysics than in the good things of this world—it certainly has very little to show; but, as a natural production, the coffee of Mocha is not to be despised, and what human work of art has ever even approached the sublime elevation of the rhythm of the Koran?

THE RUSSIAN COURT.

THAT portion of the Russian exhibition shown in our Engraving comprises several articles of great value, from their rarity and workmanship, and of real beauty of material and design. It is a department, however, made up entirely of articles for those whose wealth enables them to set no limit to the indulgence of their tastes. By the pillars stand two great candelabra, of richly-gilt bronze, each 10 feet in height, and made for fifteen lights. They are from the manufactory of Krumbigel, of Moscow, and were entered for duty at the value of £500 apiece. Looking from the centre aisle into the compartment, the most striking object is the folding-doors of malachite, 13 feet high, panelled and ornamented in gilt bronze. Our readers have probably made acquaintance with malachite as a precious stone, in brooches, jewel-boxes, and other small articles of ornament, but never dreamt of seeing it worked up into a pair of drawing-room doors. The effect is exceedingly beautiful; the brilliant green of the malachite, with its curled waviness like the pattern of watered silk, and its perfectly polished surface, is heightened by the dead and burnished gold of the panellings and ornaments, and sets one imagining in what sort of fairy palace and with what other furnishing and decoration the room must be fitted to satisfy those who had made their entrance by such precious doors. They are for sale, and valued at £6000. The large cases on either side of the compartment are also, pedestals and all, in malachite like the doors, ornamented in gilt bronze, and are valued at from £1500 to £3000 apiece; and to show that a whole suite of apartments might be decked out in the same bright precious stone, there stands to the left and not far from the doors, a mantelpiece, in Louis Quatorze style before it ran quite wild in confusion of ornamental form: the fender, hearth, fire-back, and grate are in bronze gilt and burnished gold: the mantelpiece in beautifully shaded malachite, with just enough of ornament for contrast; and on either side of this splendid fireplace are a table and chair of the same material. The chairs are valued at £120 each, the tables at £400. In the next compartment to the one we are describing, the malachite (carbonate of copper) may be seen in the strange-shaped rough lumps in which it comes from the mine, and in every stage of preparation. It is found in the copper-mines of Siberia and the Ural Mountains, and has lately been met with in equally large pieces, and of not less beauty, in the Burra Burra mines, in Australia; that in the Exhibition is from the mines of Prince Demidoff, by whom the whole is exhibited. The manufacture of articles of malachite is in itself a work of art; and, smooth as the surface seems, it is made up of a multitude of variously-shaped little pieces carefully selected to produce particular patterns, and which in their fitting require the greatest exactitude. In the doors there may be some 20,000 or 30,000 pieces imbedded in cement, made of the malachite itself. The doors are of wood covered with copper, the malachite being about a quarter of an inch thick. The vases are of three-quarter inch cast iron, and the malachite in the same way inlaid. Nor is this the only precious stone made to serve such large uses in this Russian compartment; there are also upon the left-hand side, near the great candelabrum, three real jasper vases, one of them 3 feet 6 inches in height, which has excited the admiration of those most skilled in such matters by the exquisite cutting of its border of leaves, which, as the process is not explained, they have come to the conclusion must have been done by mounting the diamond, the only mineral of sufficient hardness to cut agate, in some specially contrived machine: the value of this vase is not stated, but the cost of the workmanship alone exceeded £700, and the vase can certainly not be under £2000. These vases are the property of the Emperor, and were made at his own manufactory at Katrinburg. The great vase in the centre front is in porcelain, from the imperial manufactory at St. Petersburg, and is valued at £2500.

To the left and right in front are jewels valued at £40,000, and which are exhibited by M. Bolin and M. Kammerer, both crown jewellers at St. Petersburg.

The plate which is on another table at the right, and comprises a great variety of articles, is entirely from the workshop of M. Sizikoff, of Moscow, one candelabrum shown by whom contains 2 cwt. of silver and sets forth an incident memorable in Russian history. The Duke de Merti, Grand Duke of Muscovy, in a fierce battle with the Tartars, in 1380, fell severely wounded by a blow on the head with a hammer, a main weapon of warfare with the Tartars then: the Duke, surrounded by his staff of knights in armour, lay under a fir tree, faint and, to all appearance, dying, when a soldier of his army galloped up and announced the battle won—the Duke revived and recovered. The candelabrum represents the fir tree and the above incident.

On the same side of the compartment is an ebony cabinet, designed by Baron Clott, one of the first artists in the Russian empire. On the top is a bunch of grapes, in amethyst, so modelled, that, as the light falls upon them, they seem to show the very juice of the real fruit, and which are set off by a sprig of mountain ash in coral.

A bunch of currants, in white cornelian, in which the artist has contrived to place inside the very stone of the fruit, are so true to nature, that the Prince of Wales said, "He should really like to eat them." On the opposite end are bunches of cherries in red carnelian; and on the other sides pears and plums in agate and onyx.

In the background are seen specimens of inlaying in wood for floors; a Warwick Vase, in hammered iron, from Warsaw; a curious carpet, very bright in its colours and effect, made in squares of squirrel-skin, surrounded each by a border of needlework; and near this stands a cabinet, made by M. Yanebs, of St. Petersburgh, in light wood, with porcelain medallions from the Imperial manufactory, valued at £500, and a second porcelain vase of azure and gold, from the same works. There is still, however, spare space in the compartment, and other articles to be shown in it are on the way.

THE CANADIAN TIMBER TROPHY.

WE do not pretend that the Canadian timber pyramid, with its white birch bark canoe on top, and green draperies, as if in memory of the far ever departed leaves of its logs, forms a very ornamental object in the English end of the centre aisle; and, in truth, at first we many times wished it at the back of the bay. By degrees, however, the appropriateness of its position has grown upon us. We have looked around on all the thousand gatherings of trade brought by wind or steam in huge ships from every seaboard in the world, and then at the canoe rightfully raised to view above them all: for in such frail vessels the first traders of the world paddled from creek to creek, and island to island, exchanging fruits and roots, skins, clubs, and bows and arrows; and from such rude beginnings grew the spirit of enterprise, the desire of commerce, the daring love of sea-adventure that now crowd the waters with the commercial navies of the world; from that shell of stitched bark has man, by invention and indomitable industry, risen to his steam-ship, conquering not alone the wind and waves, but time and distance; and for the timber, though it does obstruct the view, and makes but an uncouth sort of pile, it too is there rightfully enough, reminding us that even England a few centuries ago was thick set with forests, and that the first work toward her present busy industry was to fell the old timber, and let the sunlight warm the earth. Man is no dweller in the woods; go where he may, the forest must bow before him: he clears a field for himself, and drives the plough into the soil, grows crops of annual provender for himself and his beasts of burden, and fills the land with busy multitudes. We would have the visitors to the Exhibition, therefore, pause a little by the timber trophy; it may remind them of the settlers in those regions—of those who go forth to found fresh centres of commerce; to face, in strength of the hope of independence, the toils and difficulties of planting new regions. There is a log hut look about the timber trophy that takes us to the backwoods of Canada; to the prairies of the United States, and the vast park-like sheep ranges of Australia. In their new homes the industry that has felled the woods will push its way—will not alone grow corn and feed cattle and trade in timber, but will raise up mineral products from the earth's depths, and call machinery to its help, and organise industry, and have one day a thousand fruits of skill to show at some future Exhibition.

We have not yet had possession of Canada for a hundred years. It is set down amongst the discoveries of Sebastian Cabot in 1497. The French, it is asserted, made a map of a portion of the coast in 1508; in 1525, the country was formally taken possession of in the name of the King of France; in 1535, Cartier explored its great river, and named it the St. Lawrence, from having on that saint's day first sailed upon its waters. The first settlement was at Quebec in 1608, and the country remained in possession of the French until the capture of that city by General Wolf, in 1759; and by the treaty of Paris, in 1763, the whole territory, comprising an area about three times as large as Great Britain and Ireland, was ceded to England.

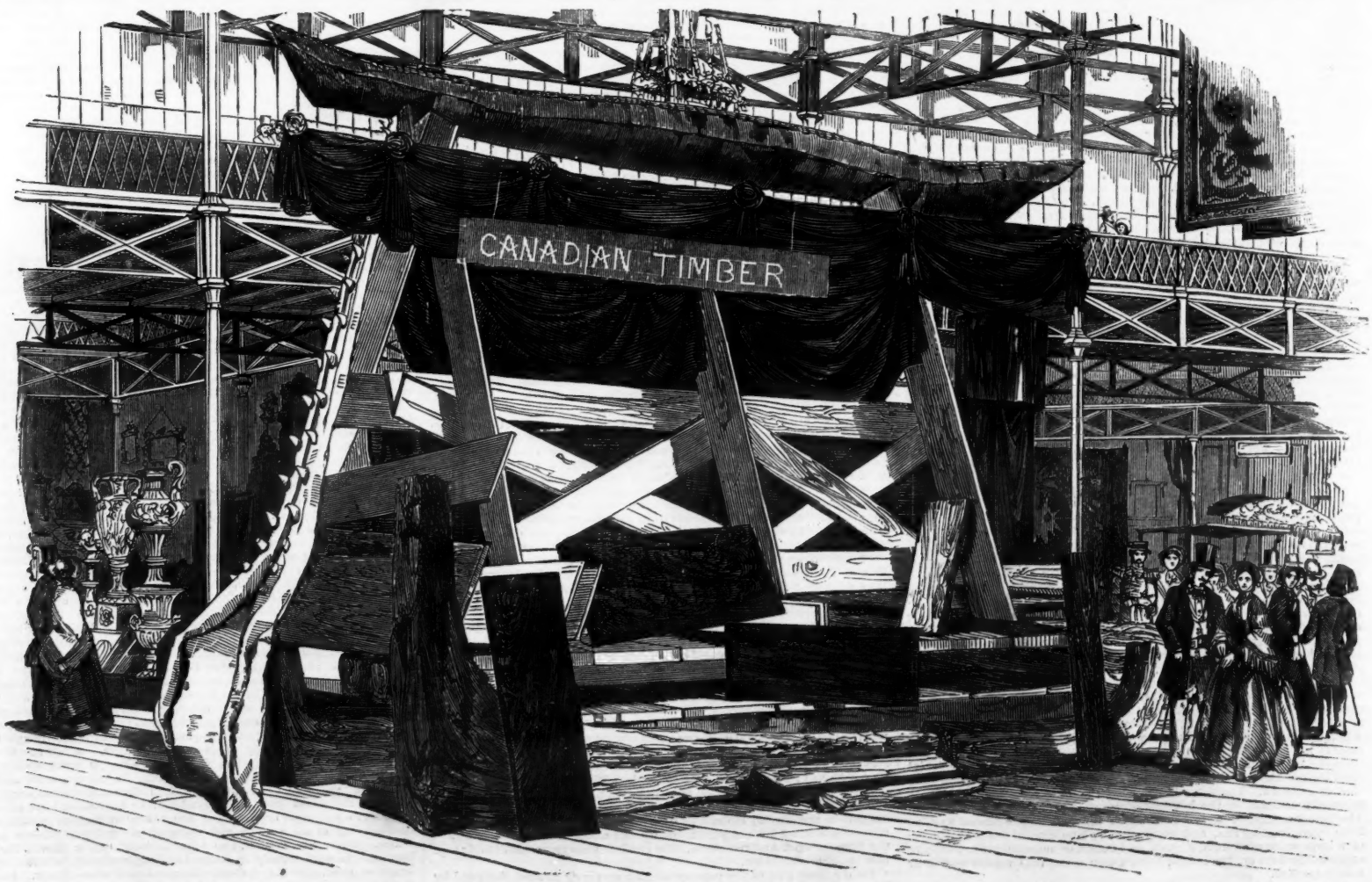
The Canadian contributions at the Exhibition, to be seen in the compartments opposite the timber trophy, and a general view of which we have already given, are in themselves sufficient evidence, that, in this England beyond the Atlantic, not alone land industry, but manufacturing skill and art-workmanship, have made progress; but still, vast regions even of the best lands are covered with forests. In 1844, the occupied land in East or Lower Canada amounted to 7,540,450 acres; of which 3,083,950 were cultivated, and 4,456,400 still unreclaimed and overgrown with wood. The great plain between Lakes Huron, Erie, and Ontario, comprising about 20,000 square miles, and the best grain country of any of the northern parts of America, is still for the most part covered with lofty forests. The Ottawa or Grand River, which joins the St. Lawrence near Montreal, forms almost entirely the division of the Canadas, and is the great highway so far the timber trade, which along its banks employs from eight to ten thousand men—an army waging perpetual war with the forests, and which, under the false impulse of our former high differential duties in favour of Canadian timber, carried on its operations most wastefully and unfavourably for the character of the timber and the advance of the trade. Hitherto, white and red pine have formed the chief timber exports of Canada, felled mainly by the banks of the Ottawa, and floated in huge rafts down that river and the St. Lawrence, a distance of from 600 to 700 miles, to Quebec. A single raft of timber will not unfrequently have a surface of three acres. The trees are cut down in winter, lopped, squared, dragged by horses over the frozen snow, which forms a slide for them to the water's edge. The rafts are formed upon the ice, on which, when the spring thaw sets in, the lumberers, as these forest-felling timber traders are called, float down to port, anchoring when they come within range at each rise of tide, and again pursuing their voyage at its fall. A raft seems almost as if some land-slip, or island, huts and all, were sailing down the river; it has five or six houses upon it, and, when the wind sets fair, a range of broad thin boards serves for sails. Some of the white pine-trees yield planks five feet in breadth, and the largest red pine will give 18-inch square logs, as much as 40 feet long. Of the red pine order is the hemlock, a ship's futtock of which is shown in the trophy, and which it is said bears water well, and is of all woods in those regions the most everlasting as railway sleepers, piles, or for any other underground purpose. But a single tree of the kind, which stands on a little island in the river St. Maurice, is to be found in all Eastern Canada. The tree in close forests is drawn up frequently to more than 60 feet in height, but its best height is about 40 feet, and its diameter in such specimens is rather more than 2 feet. The specimen in the trophy was cut from a tree 15 feet in circumference and 60 feet high. Close by this hemlock is a thick plank of a beautifully-feathered and highly polished dark wood, cut for veneers, from the fork of a black walnut—a timber extensively used in Canada for furniture, and some beautiful tables, sofas, chairs, beds, and a piano of which are in the compartments opposite, and to be sold at the close of the Exhibition. The tree from which this plank was obtained was an old giant of its kind, and, judged by its size and internal appearance, though sound as a bell, had probably spread up its evergreen leaves to the sun for more than a thousand years. It stood in the valley of the Nanticoke, in the township of Walpole; and, in the winter of 1847, Mr. Fisher, having marked it for destruction, set up a shanty near it. Its circumference at the ground measured 37 feet, three up 28 feet, from which it tapered very little to 61 feet, where it branched into two trunks, 6 feet and 5 feet in diameter; from this part the veneer plank was sawn. The whole tree cut up into twenty-three logs, and made in all more than 10,000 feet of timber. Three men were engaged a fortnight in felling and trimming this single tree. The walnut is a hard close-grained wood, and it deserves trial, as it is to be had in immense quantities all over Canada, whether it would not serve as well as mahogany for ship-building. It is exported to the United States, but has not as yet entered into the timber trade with England. Another furniture wood in the trophy is curled maple, in its wavy grain very like satin-wood, not much differing from it in colour, and growing as abundantly as the pine itself. It has also found its way to the United States largely, but in but small quantities to England, though it is a hard wood, and admirably adapted for furniture. A bird's-eye maple veneer is also shown. The finest bird's-eye is from young trees, of from twelve to fourteen inches diameter. As they grow old and large the spotted curl dies out from the centre; the veneer in the trophy was, however, shaved off from a large old tree by a peculiar kind of cutting machine, which saws or shaves off the veneer in a spiral round the log, commencing at the outside, and stopping where the bird's-eye pattern ceases. There are, besides, two other sorts of maple shown, the plain hard maple used largely in house building, ordinary furniture, and in immense quantities for domestic firewood and steam-boats. In Montreal alone there are consumed in a single season from 2,000,000 to 3,000,000 cords as firewood—a cord of wood being a bundle eight feet

RUSSIAN COURT.—SEE PRECEDING PAGE.—FROM A DAGUERREOTYPE BY BEARD.

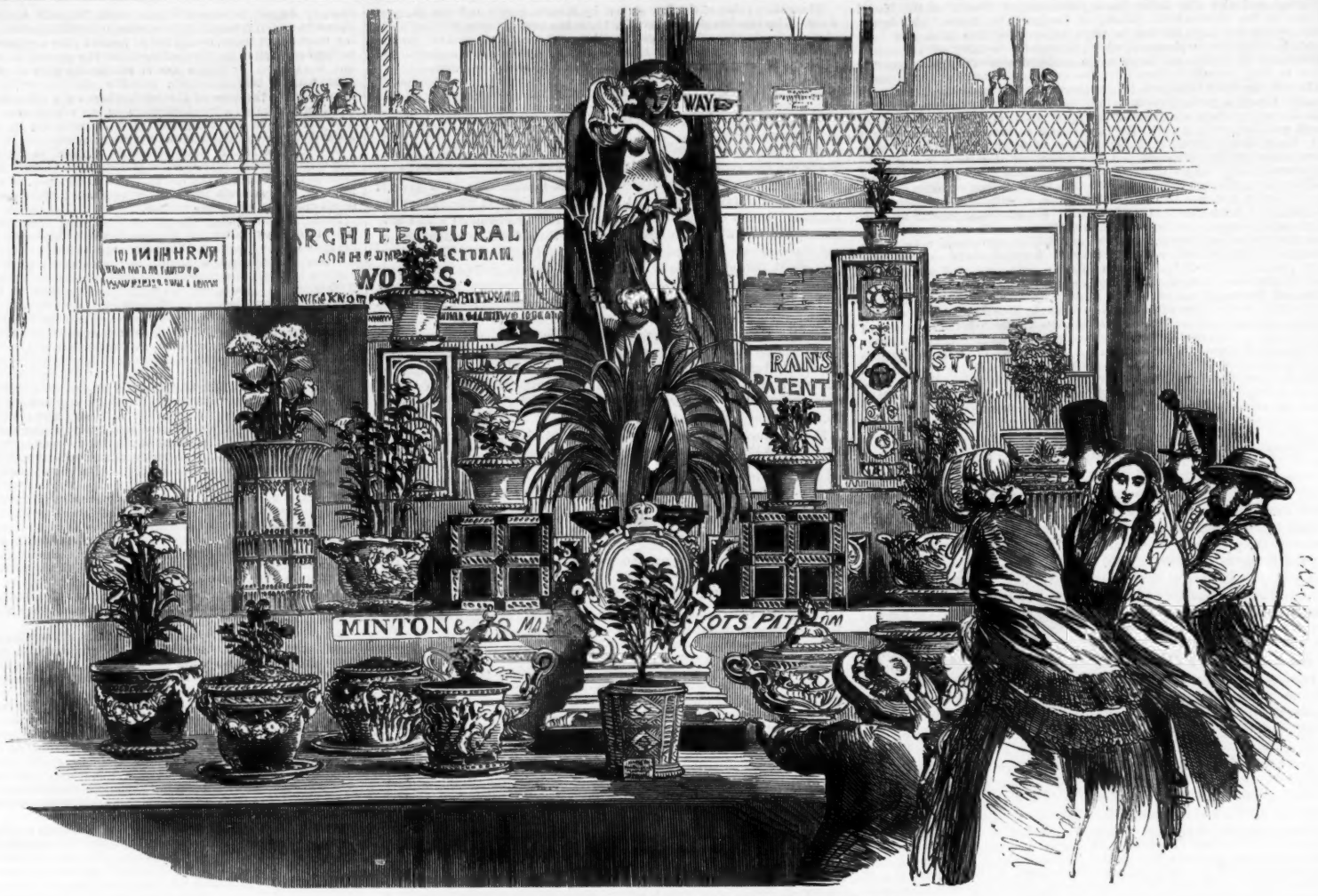
long, four feet high, and four feet broad, and costing thirteen shillings English money. Each family on an average uses about six cords in a season. The soft maple is but rarely cut down, as it supplies sugar abundantly. In spring, before the snow has left the ground, when the sun begins to gain strength, and there is still a sharp morning frost, the farmer bores, about four or five feet up the trunk, a hole some two or three inches deep, and sticks a little cane spout in it. In a few hours he has in his wooden trough below from two to three gallons of syrup; and every morning for a fortnight, as the sap rises with the sun, the tree pours its sweetness until twenty or thirty gallons are collected. In a spring without frosts, the supply of sugar fails, and its collection is a work of no small hardship. Its after preparation is a rude process: it is evaporated, to some extent, over a slow fire, and then poured out in pans to cool. The sugar maple grows from forty to fifty feet high, and about six feet in circumference. The other timbers in the Trophy are more generally known. The birch tree, and is a favourite town plantationis used in common furniture, and the timber is largely exported to the States. The oak, both white and red, is exported as staves both to America and England, and so is the ash, of which Canada can furnish inexhaustible supplies. The bass-wood is new to us, but, it seems, has been proved so useful at home that it may be imported with advantage. It is a soft wood, but close-grained and durable, resembling something our willow, and has been found most excellent in doors, and the panelling of railway carriages. The rock elm is also a new import; it grows apparently from the bare rock to a height of 30 to 60 feet, and 18 to 20 inches in diameter, a tough durable wood, and deserving trial for ship-building purposes; and the butternut, growing on fine dry land, and most of all a favourite, both in the States, and Canada, for veneering upon, as with ordinary seasoning it is never known to warp. Last on our list is a little log on the floor, with light edges and a dark centre, marked iron-wood, of no earthly use, said our native informant: "It won't float, it's the contrariest wood in creation; if you want a straight piece, and half break your heart with hard work to get it, it will twist itself crooked in no time, and if you mark out a crooked piece, as sure as sunshine it will stretch out as straight as a line, it's as hard as iron and as heavy as lead, and as obstinate and cranky as an old mule, and never worth either letting grow or cutting down."

In conclusion, we have a word of advice, in view of this timber trophy, to give our Canadian friends: it is that they begin to build ships of their better woods. Their fir-built craft stand but four years, A. 1. on Lloyd's list. They do right well to send a cargo of timber to England to help to pay their cost, but are not profitable afloat. We have to face the world now with our ships. Canada has no longer any advantage, and can only hold her place in ship-building, whether for sale or trade, by aiming to build as seaworthy and durable vessels as the Northern and United States. Cheap run-up ships, are the dearest in the end; try, therefore, your walnut, red oak, hemlock, and rock elm, and use the pine only where pine is best, and where first-class vessels use it.

The total value of the export of timber from Canada in 1849 was £1,327,532, of which not less than £1,000,000 worth came to England.



CANADIAN TIMBER TROPHY.



POTTERY.—BY MESSRS. MINTON.—FROM A DAGUERREOTYPE BY CLAUDET.

MAJOLICA VASES, PATENT WALL TILES, AND MOSAICS.—BY HERBERT MINTON AND CO.

THE majolica vases and flower-pots are a modern application of a very ancient style of earthenware manufacture, the peculiarity of which consists in glazing coarse material with a fine opaque glaze. For a very long period, the manufacture, which was confined to Italy, has been extinct, and, during its existence, was applied to such articles as wine coolers, dishes, vases, &c., which were painted in the highest style of art, and so well, that it is matter of dispute whether some were not from the hand of Raphael, and it is quite certain they were of his school. The manufacture took its name from the island of Majorca, where it was probably of Spanish origin; and the name travelling into other countries has gradually become corrupted to majolica, and by which is not to be understood ware for any especial purpose, but simply having an opaque glaze. The master art of old, however, employed upon the designs, gives with the name the idea of a high order of ornament, the more that the few specimens of majolica to be found are exceedingly beautiful, and fetch the highest prices of any ware in existence. The specimens of the revived ware shown on the stand in our Engraving were made by Messrs. Minton and Co., of Stoke-upon-Trent, expressly for the Exhibition, and are the finest specimens of the revival of majolica, so far as concerns the opaque coloured glazings; but in this department no attempt has been made at the old style of paintings. A wine-cooler, however, is shown in Class 25, in the gallery, which was modelled by one of their modellers, a student of the School of Design at Stoke-upon-Trent, and obtained a prize given by Mr. Smith Child, M.P. for the Northern Division of Stafford, for the best wine-cooler in the style of the majolica ware; and it was afterwards glazed with the opaque glaze, and painted in figures, as a true specimen of the old order. The pavements, of which old specimens are to be found in the tiles of the Alhambra, have the pattern stamped upon them by a plaster mould; it is then fired, and the indentations filled up in the opaque coloured glazes; it is then a second time fired, and is complete.

These majolica differ from the encaustic tiles, from the indentations originally made by the plaster mould in the encaustic tiles being filled up whilst in the soft state with coloured clay in a liquid condition, after which they are scraped to give a perfectly smooth surface, and are then fired without glazing. The encaustic tile is best adapted for floors the majolica for walls. Both these tiles range in price from 18s to 30s the square yard, and the flower pots shown in the engraving, though so highly ornamental, are not by any means costly. The ware has been very generally admired. The Queen immediately on having inspected the stand, had specimens forwarded to Buckingham Palace. There is also another description of wall tile shown upon the stand in four colours, and manufactured by a patent process, which is an application of printing in colours to earthenware, the novelty being that three, four, five, or a greater number of colours are, at one application, and without the slightest admixture even at the edges of the patterns, transferred to the surface of the tile, which, by the old process of laying on the colours, must have been each separately applied by hand, and the tiles severally fired after each; a complicated process of manufacture more than doubling the expense of the patent mode.

The figure of Galatea in terra cotta, life size, was modelled at the manufactory at Stoke, by a French artist in the employ of Messrs.

CASE OF FURS, SHOWING ESPECIALLY THE SEVERAL KINDS OF SABLE.—BY SMITH AND SONS, WATLING-STREET.—FROM A DAGUERREOTYPE BY CLAUDET.—(SEE NEXT PAGE.)

Minton, and who also holds the appointment of Master of the Model Class of the Government School of Design in the town. This figure, and some other large articles in terra cotta, were fired in a kiln built expressly for the purpose, and which is requisite to carry out the manufacture of all articles too large to be enclosed separately in a *saggar* or case of clay, to protect them from the smoke and flame of the furnace. The kiln for those large articles is, therefore, so constructed, that it, in itself, forms a protective covering by being built double, so that the flame plays between the outer and inner casing; and the risk in baking such articles is very great. The time required for firing and cooling is at least three times that for articles of ordinary size; for, however exquisite the art employed, the modelling of the whole might be destroyed by a single crack or flaw, the result of a little too quick heating or cooling of the kiln. The Galaten was shut up in its fire-box for ten days, and was the second; the first, a still more excellent one, having been heated too fast, and spoiled. We have only further to mention some specimens on the stand of mosaic pavement, manufactured under Mr. Prosser of Birmingham's patent of 1840, the novelty in which consisted in the discovery that the materials of porcelain reduced to a dry powder of about the fineness of flour, and subjected to a strong pressure between steel dies, is compressed to about one-fourth its former size and becomes a compact solid substance, of such hardness that it is difficult to find a stone of sufficient hardness to give the surface a polish. In fact, the stone is polished before the mosaic, which is far harder than the antique. The specimens in the compartment under notice are made of tesseræ of about a quarter inch cube, and are copies of the pavements of the church of San Bartolomeo nd Santa Maria Maggiore, at Rome. The cost of these mosaics, ordinary patterns of which are from 4s. to 5s. a foot, has been so reduced by Mr. Prosser's process as to make them an article of English manufacture and considerable use.

FURS EXHIBITED BY MESSRS. GEORGE SMITH AND SON, WATLING-STREET.

THE first proposal as to the exhibition of furs was, that it should be a joint affair amongst the merchants, wholesale dealers, and retailers, a shape in which (although four of the leading houses in the trade contributed to the great case in the centre of the Western Nave, which goes by the name of the Fur Trophy) the project did not get carried out; the wholesale dealers at first hanging back, under the impression, that, though furs might be shown of every class, and in every stage of finish, they scarce sufficiently formed an article of manufacture for exhibition: finally, however, nearly all dropped in, it being felt that a branch of trade occupying so large an amount of capital and employing such a number of hands shou d be fairly represented; and, therefore, in the wholesale trade, Messrs. George Smith and Sons, of Watling-street, Robert Clark and Sons, Cheapside; Bevingtons and Morris, King William-street; Lutze and Co., King Edward-street; Myer and Co., Bow-lane; and George Ellis, Fore-street; and in the retail, Nicholay and Son, Oxford-street; R. Drake, Piccadilly; Ince and Son, Oxford-street, became exhibitors either in the common case or in spaces of their own.

The greater portion by far of our furs come through the Hudson's Bay Company; and the trade differs from every other in the world.

More than 180 years since, Charles II. granted to Prince Rupert and others a vast extent of territory in North America, stretching along the coast from Hudson's Bay to the Pacific, and how far inland is best expressed by saying that it includes all the land, with the exception of Canada, New Brunswick, Nova Scotia, and a little strip of Russian possessions, from the North Pole to the boundaries of the United States. The region is, with the rare exception of the Company's station, as wild now as when King Charles's grant was made; no forests have been cleared, no roads made, no colonies planted; the whole forms a vast hunting-ground—a preserve for such vermin and wild beasts as nature has wrapped in coats of thick, soft, warmth-preserving fur.

The whole number of persons employed by the Company amounts to four or five thousand, and those on the spot are all natives of the Orkneys. The animals, however, are trapped and hunted entirely by the American Indians, who in the spring time bring in to the several stations the produce of their winter's toil and cunning, and barter the furs for arms, ammunition, blankets, knives, hatchets, and their ever-favourite tobacco. Money never passes; but until 1822, when the union of the Hudson's Bay and North-Western Companies took place, rum and brandy were always a large item in the exchanges, and served during a long period to thin the native Indian races.

The supply of various kinds of furs, from various causes, fluctuates greatly. The marten, or real sable skins imported from Columbia River in 1848 exceeded 29,000; in 1849, 23,000; 1850, 13,000; and, in the present year, have fallen to 11,377; and from other parts, by the Company, in the same years, were, in round numbers, 54,000, 26,000, and 25,000. Sometimes a fire raging through the woods for miles destroys multitudes of animals; sometimes an unusual severity or continuance of frost cuts millions off; or some sickness seizes whole species, or the Indian hunters are themselves the subject of some epidemic that unfits them for a portion of the season for the field. It does not, however, appear that any general decay of any of the fur-giving animals has taken place.

The fur of most general consumption in England is what is called real sable, specimens of which are shown in the case before us, the greater part of which are imported by the Hudson's Bay Company, and some of a common sort are brought from Canada and the United States. A very small quantity are imported from Russia, but the high price limits the demand, the best skins fetching from £5 to £10 a skin.

The three distinct sorts, which are very frequently ticketed in shop-windows Russian sable, are shown in the case side by side, for the express purpose of enabling the public to observe the distinctive character of each. The Russian is finer, darker, closer set; has a richer under-down, and a peculiar mouse-tint in the colour, quite distinct from Hudson's Bay and Canadian. The Hudson's Bay marten or sable, which stands next in value to the Russian, are from 9s. to 36s a skin, according to the darkness and uniformity of colour, and are also easily distinguishable from the Canadian, which are a smaller skin, and of a redder shade, and worth from 6s. to 15s. Russia, America, and Paris are the chief consumers of the real Russian sables, the quantity used in England being very small. The ordinary articles in use, such as muffs and riding boas, take about four skins each.

The same case also contains a muff and riding boa made entirely of Hudson's Bay sable-tail, an article much esteemed by the higher classes in England; they are dark, not very expensive, and surpass all other furs in durability, &c. The other furs shown by the same firm are chinchili, Russian squirrel, Siberian squirrel, specimens of dyed squirrel, fitch, and dyed fitch. Those in fitch are from skins of pole-cats caught in Scotland, and not inferior to those of any other country.

The chinchili is from South America, an article always in esteem, but too delicate for hard usage. Of late, however, it has come largely into use in Russia. No other fur can be put in imitation of this; and the value of the skins is from 24s. to 60s. per dozen.

The squirrel and dyed squirrel (imitation sable) are an article that wears well, and is of very great consumption. The skins are so cheap, that tippets sell at from 1s. to 12s. each; and some idea may be formed of the consumption from the fact that not fewer than 20,000,000 squirrels are annually killed in Russia to supply the trade.

In scarce any business are people more grievously imposed upon than in the purchase of articles of fur; and in every instance, as this case may serve to show, a very little knowledge must serve as a protection. Rabbit and ermine (except that both are white, and have black tails stuck on) are as unlike as two furs well could be: the ermine, brilliant, fine pointed, the taper hairs lying close and evenly; the rabbit, blunt and coarse; and yet we have heard of a lady giving £20 for a white rabbit cardinal, which, were it real ermine, would not have been worth more than from £12 to £13.

The great enemies in a fur warehouse are moths and rats—the former kept off by constant care, the latter requiring no small expense in warehouse arrangements. Messrs. Smith and Son had to sink their floors below the rat runs, lay down three feet of concrete, and thick coatings of asphalte continued for three feet up the walls. The warehouse, though devoted exclusively to furs, is not second in extent to many of the general warehouses in London, and is the largest in this single trade.

The manufacture of furs employs a considerable number of hands, and is done entirely by piecework through chamber-masters, who cut out and match, and employ as many women to sew as they can keep going. A master will cut and have made up from 1500 to 3000 squirrel skins in a week, and will earn, if strong-handed, from £150 to even £400 a year, from which, however, he has to pay his sewers and finishers, and for which he must work often 18 hours a day.

The entire value of the furs shown by Messrs. Smith and Son is about £400. The boa hanging under No. 10, in the case between the two chinchili muffs, is of the finest Russian sable, and worth about £50; and in the bottom of the case to the right is a muff of the same material and price. The boas hung outside the case are by Nicolay and Son.

HOROLOGICAL SECTION.

(SECOND NOTICE.)

SINCE our first general notice of the clocks and watches exhibited in the British department, we have devoted considerable time to a general examination of every horological production exhibited throughout the Building. In this excursion through all the various countries which have contributed to the World's Fair, we found the difficulties attendant on, and disadvantages of, a geographical arrangement of articles exhibited very great indeed, especially with such a useless guide as the Official Catalogue. It was only by exploring every court, passage, avenue, aisle, and gallery throughout the Building, that we were enabled to discover the whereabouts of the various clocks, watches, and other horological apparatus contributed by the foreign exhibitors; and even in the British division of the show of clocks and watches, though a philosophical arrangement, has been successfully carried out to a considerable extent, we discover several interspersed with the plate and jewellery which attract so much attention in the Middle Gallery South, and contiguous to the British Horological Department.

In commencing our survey, we first entered the "United States" department at the east end of the Building, and finished in "Great Britain" at the west end of the Building—travelling through Russia, at that time a barren wilderness, but now becoming civilised, Austria, the Zollverein, Greece, Turkey, Italy, Switzerland, Holland, Belgium, France, Persia, India, China, &c.

The only countries which have sent specimens of clocks and watches to the Great Exhibition are the United States, Austria, Prussia France, Holland, Belgium, Switzerland, and the British Isles. The only real clock-producing countries are America, France, Switzerland, and the United Kingdom. The Americans make no pretensions to exquisitely finished watchwork, but have gone a-head in this as in every other branch of mechanical manufacture, with a view to utility and economy rather than to excellence of workmanship or beauty of design. It is well known that most of the American clocks keep excellent time, and the reason is obvious: as a rule, there are no complicated parts in their clock movements; moreover, the wheels and other important parts of their clocks, having been first very accurately set out and modelled, are multiplied by machinery to an enormous extent: thus, two American clocks from the same factory are far more likely to go together, as it is called, or to keep uniform time, than two of the most exquisitely finished productions of our first-rate clock-makers.

France exhibits a large collection of clocks and watches, by her first makers, in which we discover many fine specimens of clock-work, in particular, and numerous examples of astronomical clocks, &c.

Switzerland contributes an exhibition of itself, in the Middle Gallery South, near to the Transept, consisting of every variety of Geneva watch, from the size of the top of a pencil case to that of the large and flat English watch of the present day. To the watchmakers of Switzerland we are indebted for the convenient arrangement of the works of modern watches, by which so little depth is required within the case for the accurate performance of their works. Although Geneva may be called the seat of the clock manufacture, yet the manufacturers of Chaux de Fonds have sent many of the beautiful specimens of Swiss taste and ingenuity in the display of watches which attract all visitors to the Swiss department.

But, while we admire the go-ahead system of the American clock-makers, the elegance of design and finished workmanship of those of France, and the ingenuity and exquisite taste displayed by the Swiss, we are proud to proclaim, that, in the British division appropriated to horology, we find the choicest and most surprising collection of clocks and watches that have ever been witnessed by man; and we draw the special attention of our readers to the western division of the Middle Gallery South, and not far from Willis's Great Organ, in which they will find the results of scientific attainments and practical knowledge, on the part of masters and men, that may proudly be held up to the admiring multitudes from all the nations of the earth as the veritable gems of the Great International Exhibition.

In our present notice, we intend to do little more than give the names of exhibitors, with the articles they contribute; but we have prepared, and are still preparing, detailed accounts of the best specimens of clocks and watches contributed from different parts of the world.

Commencing with the United States, we find that Messrs. Rodgers and Co., of London, exhibit upwards of fifty clocks made by Chauncey Jerome, of Newhaven, Connecticut, U. S.; and Messrs. Holloway, also of London (No. 514 in the Catalogue), show twenty-nine clocks, also of the true American cut. There is one clock in this department, however, known as "Crane's Patent," and exhibited by the "Year Clock Company" of New York, which differs from all the others shown in this department, in that the pendulum, instead of vibrating as usual, is made to rotate, first in one direction, and then in the other, within a circle of short radius. The absence of the inventor, or some person understanding the construction of this clock, prevented us from obtaining any account of the working and advantages of this horological novelty. We omitted, in the first part of this notice, to mention that a great deal of the work in the manufacture of American clocks is executed by females, especially the painting of the dial figures.

Hamburgh, No. 10. Mr. J. L. Nieberg, exhibits a constant pendulum clock, with centre seconds, the whole mounted on four columns.

Hamburgh, No. 11. Mr. Brocking, who is one of the principal clock-makers of the free city of Hamburgh, exhibits a clock escapement, in which the impulse is given without the irregularities occasioned by the movement and by the oil. It is placed on a light double bracket. He also exhibits an electro-magnetic clock (bearing date 1850), by which the impulse is given by the gravity of a lever, independent of the greater or less intensity of the magnetic fluid.

Zollverein, Seebas and Co., of Offenbach, contribute three samples of cheap time-pieces, the dials of which are of ground glass, either square or circular mounted, on pedestals, the works being enclosed behind the dial in a small metal case.

E. G. Zimmermann, of Frankfort on the Maine, exhibits two time-pieces of somewhat similar design, but each having a pendulum, and also sockets for candles. The above are exhibited as low-priced articles.

Prussia (No. 75), Gustave Seemann, of Warmbrunn, exhibits in the north east recess of the Octagon Room three little clocks, less than an inch in width, the pendulums of which seem to be continually racing: these diminutive articles, however, are more for ornament than use, as they are not found to keep time accurately.

Wurtemburg (No. 18). In the same recess is a neat and well-finished pendulum clock, in mahogany frame and glass case, with centre seconds, exhibited by W. Holch.

In the Octagon Room (No. 443) are two ivory watches, by Michael Dorer, under a glass case on pedestal, near to the south entrance. In the same room, A. Bacher, of Stuttgart, exhibits a small watch set in a bracelet, after the Swiss fashion, which is much admired by the fair visitors. He also shows an ivory watch; a second, more like the English make with centre seconds; and, lastly, one for scientific purposes.

Saxony, A. Lange exhibits ten plain watches, as also the parts of a watch, but not nicely arranged and without labels—very different from the analytical classification of the parts of a watch as exhibited by Messrs. Rotherham, of Coventry. In the Middle Gallery South (Prussia, No. 63), Pierre Guerlin exhibits, as specimens of cheapness of production, twenty-three enamelled circular-faced time-pieces, with pendulums, valued at about from 12s. to 20s. each; also three very common-looking mantel clocks, one in china case, which shows the time at twenty-two different places.

Prussia, No. 72. A portable carriage clock of superior workmanship. Contiguous to the above is an attempt at turret lock works, striking hours and quarters—workmanship very inferior.

Descending from the Gallery we entered the Austrian department, on south side of the Nave, and found answering to No. 165, two mantel-piece striking clocks, exhibited by Anton Liszt, of Vienna; altogether, 32 clocks in this division, including an old pendulum clock, with glass front and sides, and three flat clocks in square gilt frames, in very common use in different parts of the continent of Europe.

Jacob Schwarz, also of Vienna, has sent several models of churches made of mother of pearl, each having a small clock with external pendulum.

Crossing to the north side of the Austrian allotments we found No. 170 appended to a compensation pendulum clock, in neat case, by August Selisko, of Prague; and Pasquale Anderwalt, of Trieste, shows two of the most curious clocks in the Exhibition. Without knowing more about them, we cannot at present offer a satisfactory opinion as to their respective merits: suffice it for the present to mention, that the one worked by hydrogen gas is said to be able to perform for thirty years without being touched; and the other, in which the power is obtained by the pressure of the atmosphere on a reservoir of quicksilver, is calculated to go a hundred years or more with very little attention. The absence of an interpreter here is much felt by those who crowd around Anderwalt's extraordinary productions.

Austria, No. 169. S. Kralik exhibits a clock, and also various movements; the whole placed on a pedestal. A picture clock is suspended near to the extraordinary clocks above mentioned, in which the hours, minutes, and seconds respectively appear at their proper intervals in small openings left in the picture.

In the Middle Gallery North we discovered the contributions of two exhibitors from Holland. The one, Andrew Howhu of Amsterdam, No. 86, shows a clock with the hour circle excentral, extending to 24, above it a seconds circle, while the minute hand alone is central. He also exhibits a half seconds chronometer, the property of Prince Henry of the Netherlands. The other exhibitor from Holland is A. Kaisir, of the Hague, who contributes a small pendulum clock in plain case.

The clocks and watches from France are placed together on the north side of the eastern part of the Nave: there are upwards of twenty ex hibitors. We commence with A. Brocot (No. 441 in Catalogue), who contributes eleven, chiefly astronomical clocks, which are very much in vogue in France.

653. G. Moser exhibits altogether 41 clocks, some astronomical, others elegantly mounted, one in particular of globular form, which is supported by an eagle; others again are attached in an artistic fashion to the backs of inkstands. The combination of watches in particular with other articles of utility is fully illustrated in the Swiss department.

1186. Le Roy shows a handsome astronomical bracket clock, a large clock surmounted by warlike figures, and 11 watches elegantly set with brilliants, &c.

1401. L. Potonié exhibits twenty-seven clocks, of various designs; one of which is ornamented with singing-birds, perched on the branches of a tree. This description of horological ornament may be seen to advantage among the French *bijouterie* on the south side of the Nave. Potonié also contributes three portable carriage clocks, and three others.

L. C. Bourgeois, of Morez de Jura, exhibits three pendulum clocks, and two carriage clocks or "Imperials."

14. Baily, Compte, and Son, also of the same place, which would appear to be one of the principal seats of the French clock manufacture, contribute one specimen of clock-work.

415. Chavin, also of Morez, has sent to the Exhibition some old clocks, seven in number, and one skeleton, with compensation pendulum.

984. Reydor Brothers, and Colon, of Morez, three clocks, in polished wooden cases, of old construction; also one pendulum clock, and two striking clocks.

408. Phillibret Bally exhibits his chronoscope, by which the exact time may be ascertained without calculation at any place on the globe. The following curious notice is attached:—"This instruments will set himself according to any place, is of service to all parties, and is very useful for country residences; it marks the time with a precision who no sun-dial the best finished are able to reach, which after all gives only the quarters of an hour." The same person contributes nine clocks.

350. Pierret, of Paris.—One mantel-piece clock, in marble case, and twelve small pendulum skeleton clocks.

525. Gourdin, of Mayet, contributes a handsome musical clock, which strikes on five bells; the whole enclosed within four fluted columns.

611. S. Marti and Co.—Seventeen various movements.

1425. A Redier exhibits his Horograph, for use on railways; it is partly for the same purpose as Whishaw's Centimetral Chronometer, but more complicated in its use. He also exhibits his "Controller," for registering the velocity of a train at each minute, and at each mile or kilometre, the time of stopping at each station, &c.; giving, in fact, the complete results of the progress of a train from the commencement to the termination of its journey; also a carriage clock.

344. V. Pecheloche.—A thirty-five day pendulum skeleton clock.

965. A Poulat, of Lyons.—Six flat watches.

1664. M. Moinet, director of the house of Brequet, exhibits chronometers giving "several unusual indications," as the days of the week, month, and year, respectively. M. Moinet is not quite correct in calling such indications *unusual:* any person looking through the various clock departments, will find a great display of clocks with such indications; the great clock from Exeter is, perhaps, the finest example exhibited. Also four clocks.

357. A mantel-piece clock, surmounted by two bronzed figures.

736. J. Wagner competes with Shepherd and Bain, by exhibiting his electro-magnetic clock with two faces—one on the north side of the eastern part of the Nave, and the other on the south side, and immediately opposite to the first. The works of this machine are not to be compared, either in workmanship or simplicity, with those of Shepherd's, of three faces, and which has already been described in the ILLUSTRATED LONDON NEWS. M. Wagner also exhibits on his stall, fronting the Nave, two examples of large skeleton works with compensation pendulum, and a chronometric apparatus to verify the law of gravity: this is placed next to the Nave, and consists of a vertical cylinder, made to rotate by clockwork; the cylinder is covered with paper, on which lines are marked by means of a pen, and from which the necessary results are obtained. On the same stall is a glass case containing five watches and two movements.

733. Vissière contributes three chronometers, four watches, and parts of movements. Another clock (231) is exhibited on a pedestal in front of this stall, as above.

1589. On the east side of the same stall is a splendidly finished regulator, by Detouche and Houdin, on gilt case, with compensation pendulum. The minutes are indicated on a circular dial below the clock face. Contiguous to the above, under a glass case, is a handsome astronomical clock. The rising and setting of the sun are indicated, and also its elevation. Below the hour circle are two smaller circles, in which are shown the days of the week and phases of the moon respectively. The equation of time and the day of the month are indicated on segmental plates recessed below. Next is a handsomely gilt clock with compensation pendulum: the dial is supported by two bronzed figures. Three plain clocks in black enamelled cases, eight other clocks exquisitely finished, and watches under glass case; also parts of clocks and two small clocks. On the south side of the Transept we found another example of the introduction of time-keepers into other useful articles. It is a small time piece, 6 inches in diameter, placed in the back of a carved sideboard, by E. P. Durand, of Marais.

1018. In the aisle north of the Nave two clocks are exhibited by the Vieille Montagne Zinc Mining Company, merely as specimens of their ornamental zinc work: on the top of one is a representation of "Jean Sanspeur," and on the top of the other is represented "the Wrestlers." Several other samples of the perfection to which this company have brought their zinc manufacture are exhibited, especially that of her Majesty, in the foreign division of the Nave.

Leaving France, we first looked for the Swiss watch exposition on the ground-floor of the Swiss department, but found only one article indicative of the particular display we had heard so much of. It is numbered 61, and is a machine for cutting out and stamping the hands, by Darier, of Geneva. Thence ascending to the Middle Gallery South, we were not long in finding the Swiss collection of watches, which is placed near to the visitors' seats at the angle formed by the front of the South Gallery and Transept.

The first article which attracted our attention was a handsome flat gold watch (No. 29) by P. Evard, of St. Blaise; next a chronometer, with independent seconds, by Henry Grand Jean, as also five others.

268. A flat, independent seconds watch, with metallic thermometer, twenty holes in rubies, and compensation balance, by Kramer.

266. Figuet Brothers.—A gold watch with duplex escapement.

34. Frederick Courvoisier, of Chaux de Fonds.—Five watches.

18. Perret, of Brenets, canton of Neufchatel, has invented and perfected a complete and elegant pocket-clock and independent repeater, which strikes the hours, the quarters, and the minutes, forty-two holes in rubies; the whole is beautifully got up.

17. A repeating watch, with perforated dial, to show part of the works, by Justin Kopp.

263. Lecoulte and Golay exhibit movements with teeth of various numbers.

16. Meroz Dely.—Two flat gold watches.

Bauss also exhibits two flat gold watches, on one of which is an engraved representation of Paxton's Crystal Palace.

20. Francis Moser.—A gold watch.

28. A chronograph, for taking the times of observation, by H.A. Pavre. The time, by this invention, is accurately taken to the fifth part of a second.

7. Flat lever watch with compensating balance, twenty-four holes in rubies.

267. E. and A. Paillard, of St. Croix, canton of Vaud, exhibit a beautiful little watch, with a portrait of the Queen of Holland, set with diamonds.

13. F. Bovet, of Bienne, contributes a 370-day flat gold watch, handsomely engraved, and also a second gold watch.

11. Henry Augustus Fivre, of Locle, exhibits an instrument for determining the epicycloidal curve of the teeth of wheels and pinions.

28. A flat gold watch, by Cæsar Vaucher, showing equation of time, months, &c.

24. A pair of open-faced watches, with centre seconds, by Charles Henry Grosclaude, of Fleurier.

21. A glass case containing six flat watches by Perret and Son, of Locle.

264. Three silver watches.

15. Messrs. Mermod Brothers, of St. Croix, exhibit a chronometer, an eight-day gold watch, and four others handsomely set.

22. Louis Andemars exhibits eleven watches of various kinds.

74. Messrs. Baron and Uhlman, of Geneva, contribute fifteen watches, some of which are patented on account of improvements therein.

31. Henry Boek, of Locle, contributes seven silver watches.

219. Under this number are exhibited, by Duterle, a splendid lot of exquisitely finished bracelets, rings, card-cases, &c., each containing "a love of a watch," to borrow the expression so often used in this part of the Exhibition by many of the thousands of fair visitors who are attracted to the horological display of the Swiss allotments.

3. F. A. Reigel, of Couvet, contributes tools used by watchmakers, especially a pivot and depthening tool.

9. F. W. Dubois, of Locle, a marine chronometer of new construction.

19. Two "Imperials," or carriage clocks, are exhibited by Henry Borel, of Chaux de Fonds.

30. Pierre Gerard, of the same place, also exhibits an "Imperial."

91. Two similar clocks are contributed by Henry Leuba, of Basle.

99. Philippe Patek and Co. exhibit a great variety of real Swiss watches altogether seventy-one in number, the smallest being not more than three-eighths of an inch in diameter. Many of these watches have exquisitely finished miniatures let into their cases; some also are set with brilliants. Among these miniatures we find one of our most gracious Queen, and another of the "Queen of song," whose charming notes have been echoed even among the Swiss mountains.

94. Lutz, of Geneva, contributes very delicate hair springs, suited to marine chronometers.

96. W. Mann, Esq., of London, exhibits six beautiful watches, by S. Mercier, of Geneva, four of which have ornamental enamelled backs.

92. A. L. Golay, of Geresche Geneva, shows a repeater chronometer, with metallic thermometer attached.

245. Two small watches, with compass to each.

220. Here is another example of the introduction of a watch into some other article of every-day use, which, in the present instance, is a memorandum-book, and is exhibited by L. Golay, of Geneva.

Henry M. Golay, also of Geneva, contributes a handsome repeating watch, with centre seconds. The hands are delicately coloured, which produces a good effect.

25 is attached to a case of five watches, also watch movements and pinions, by A. Lecoutre, of Sentier, canton of Vaud.

96. A novelty in the shape of a half chronometer, for the use of the deaf and blind, which, with a pencil-case attached to the key, is exhibited by S. Mercier, of Geneva.

78. Every one who takes an interest in the display of clocks and watches is anxious to find out the "tiny watch," which is contributed by D. H. Elffroth, of Geneva. This little time-keeper is contained in the top of a long gold pencil-case, is not more than three-sixteenths of an inch in diameter, is jewelled in eight holes, and, besides showing the time of day, the days of the week and month respectively are also shown, and it is stated to go "with the same perfection as a large watch." Two flat watches and chronometers, one with a compensation balance, complete the Swiss collection; before leaving which, however, the obliging policeman in charge introduced to our notice a beautiful little mechanical singing-bird, which is made to flap its wings most naturally and to pour fourth its sweet delightful notes. It is caged within an ornamental piece of china, the top of which encloses the little gem so soon as the tune is over.

On leaving the Swiss collection of watches we at once proceeded towards the magnificent display of the products of British horological science in the Middle Gallery West, adjoining the attractive show of plate and jewellery by Garrard and others: on casting a glance at which, we discovered under the number 87, Class 23, a collection of chronometers, &c., by Phillips, of Cockspur-street, consisting of three two-day marine chronometers, a carriage timepiece, or "Imperial," with lever escapement, two camp timepieces; a repeating library clock with duplex escapement; compound chronometer balance helix pendulum spring, jewelled in six holes, beats seconds and strikes the hours; two small "Imperials;" four alarums, three in mahogany cases and the fourth in glass case, and, lastly, seven lady's and gentleman's gold watches, and one of silver.

92, in the same class, is appended to the articles exhibited by Harvey and Co., including a "minute striking watch," which beats the seconds distinctly, and striking every minute or 60th second; this is certainly a novelty in watch-making, and for scientific purposes very useful.

C. F. Hancock, in the same class, No. 112, contributes, first, a flat eight-day carriage clock, with fine lever movement, by Cole—famous for clocks of this description: second, a flat eight-day carriage clock and movement by the same maker, which strikes the hours, half-hours, quarters, and repeats the minutes, ordered by her Imperial highness the Grand Duchess of Leuchtenberg; the border round the dial is of fine gold richly worked; within are the arms of the Grand Duchess in their proper colours: third, another flat carriage clock by Cole, which strikes the hours, and has an almanac under the hour circle.

Michael Emanuel exhibits also, in Class 23, No. 119, a handsome silver clock on pedestal, ornamented with several figures, including one of Time, and surmounted by a Roman chariot drawn by four horses.

Class 23, No. 27.—Lister and Sons, of Newcastle-on Tyne, exhibit a half seconds vertical chronometer, and a handsome timepiece in glass case.

Martin and Co., of Cheltenham, contribute a timepiece in fanciful mahogany case, the peculiarity of which, invented by Burgess and Hewitson, we have not been able to ascertain.

As already observed, the collection of British clocks and watches, forming part of Class 10, are worthy of a close examination by every visitor to the Crystal Palace. The arrangement of the collection has been made by a committee appointed by the exhibitors, and certainly is highly creditable to them. A peculiarity in this section of the Exhibition is, that an intelligent person has been appointed to the special charge of the collection; and being himself a practical watch and clock maker, and very obliging, is not only able, but willing, to render every assistance to the enquiring multitude attracted by this costly horological display.

Against the eastern division wall are the productions of Gowland, Parkinson and Frodsham, Aubert and Klaftenberger, and Bennett, of Cheapside.

No. 27. James Gowland's Regulator.—The great novelty of Mr. Gowland's pendulum is its freedom from nearly every impediment to perfect measurement of time. It is not only rendered free from all friction in the escapement and train from the influence of oil, the jar of the crutch or other connexion with the escapement, but fully accomplishes that most desirable end, viz. the perfect equality of the axis of vibration, as long as the clock has power to lift the weights. The methods adopted comprise improvements in both the pendulum and the escapement. In respect to the former, the pendulum is so constructed as to have the top and all parts forming it, as also the glass cylinder for the mercury, so firmly united by clamps and screws as to prevent the possibility of any shake or tremor. The cap of the cylinder is made perfectly mercury-tight by being pressed down by a clamp nut, which, at the same time forces the rod with the regulating index-nut against the top of the frame,' and fixes it in any given place for true time. The top of the pendulum is attached by two equal springs to strong solid clamps, screwed outside each plate, and suspends the spring bar at right angles to the plane of the pendulum's motion. Through the centre of this bar passes a rod or beam, parallel with the seat board, and exactly in the centre of the frames. At the extreme end of which rod or balance beam are two adjusting screws, having hard polished conical points, to take the small hollow weights, which keep the pendulum in motion. These points are so adjusted, that they, together with the centre of motion in the pallets, as also the point of suspension of the pendulum, and the upper surface of the arms of the escapement, all range in the same straight line, and thus have a common centre of motion. The position given to the pendulum exactly in the centre of the frames, and close to the seat board, is the best possible situation for it to receive the impulse of the weights lifted by the escapement, and for securing the greatest firmness in the point of suspension. The improvement in this escapement, is, that by two long arms, extending from each side of the pallets, having open spaces or forks at their extremities, it lifts alternately through equal spaces the small weights after each is deposited by the balance beam of the pendulum, holding up each in turn until the balance beam, rising on one side, receives the upper weight, and descending on the other side deposits the opposite weight on the escapement arm. After the deposit of the weight it immediately unlocks the escapement from its dead point of rest, and the escape-wheel acts on the inclined plane of the opposite pallet, and the weight is again lifted to its former position. The adjusting screws at the ends of the balance beam admit of the most delicate and certain adjustment of the beat of the clock, so that, at the same instant, the weights are respectively lifted from the one and deposited on the other side of the escapement. By the above means Mr. Gowland has secured all the advantages that a perfect point of suspension and structure of pendulum can effect towards the absolutely equal division of time, as the pendulum is never in any manner or degree subject to or influenced by the mechanism. This certainly must be considered as a very important step in the construction of regulators.

No. 35. Astronomical clock by Parkinson and Frodsham, with mercurial pendulum, in handsome mahogany case.

Next in order, Aubert and Klaftenberger, of Regent-street, have produced a great novelty in clock-making, in the shape of a regulator having a seconds and a half-seconds pendulum, a glass pendulum rod, with the mercury distributed in several vertical glass cylinders arranged in circular form. The movements cannot be described without the aid of diagrams, which are, however, in course of preparation.

No. 1. Mr. Bennett, of Cheapside, contributes what he terms "an economical regulator," which has a mercurial pendulum, and beats half-seconds.

Leaving the eastern wall-space, we approach the first stall or counter, immediately opposite, and find several springs by J. Brookes, including a main-spring for a two day marine chronometer, exhibited under the number 23.

33. An elegant large skeleton clock, by John Moore and Sons, Clerkenwell: green and gold letters in open-work; strikes on five bells.

Under the same number, T. R. and J. Moore exhibit a beautifully designed table clock, in blue, green, and gold, the hands being finished in green, white, and gold; also an elegant skeleton clock, of smaller size, finished in green and gold.

28. Tanner, of Islington, exhibits a silver watch, the peculiarity of which is, that it shows both Greenwich and Liverpool time, which he calls a "Polhorion."

39. C. Elisha.—Two silver lever watches, one with compensation bar, compounded of brass and steel.

21. H. Gibbs.—Flat watch, showing double time.

8. J. Cragg exhibits a model of a lever movement: also thirty-four gold and eight silver watches.

46*a*. Mr. C. Copland contributes some horological curiosities; first, a "warming-pan" silver watch, with gilt face, said to be the carriage clock or watch of Henry VIII.; also a pedometer and watch used in the first survey of New South Wales.

52. Aubert and Klaftenberger, whose regulator we have already mentioned, show, first, a fine repecting watch, striking the hours, quarters, and half-quarters, with a compensating lever escapement, jewelled in twenty-two holes; the moon's age, and the day of the month are shown: second, a pocket chronometer, jewelled in six holes; third, a compensated duplex hunting-watch, jewelled in five holes; fourth, a compensated lever hunting-watch, with going barrel, jewelled in twelve holes; fifth, a compensated duplex watch, going barrel, jewelled in eight holes; sixth, a compensated lever watch, with ¾-plate, jewelled in ten holes; seventh, a compensated lever hunting-watch, ¾ plate, jewelled in seven holes; eighth, a compensated duplex watch, jewelled in eight holes; ninth, a compensated lever watch, going barrel, jewelled in ten holes; tenth, a duplex watch, going barrel, jewelled in eight holes; eleventh, and lastly, a two-day marine chronometer.

James Gowland, besides the regulator already mentioned, exhibits his patent concentric chronometer, a chronometer escapement, a handsome carriage clock, and one silver and four gold watches respectively.

A large clock in gilt case standing on a pedestal, with figures representing night and morning, the whole surmounted by a figure of Britannia is exhibited by John Walker. The novelty of this production consists in a series of moveable tablets, appearing in a slight recess in front of the pedestal, at intervals of two minutes. These subjects are indicative of the progress of time and science in the civilisation of Great Britain. The first subject is that of the ancient Britons leading a wandering and savage life; the second subject represents a Roman governor of one of the English provinces, pointing out to the Britons the advantages of agriculture; third, Henry II. protecting and granting lands to the Flemish weavers; Earl Rivers presenting Caxton to Edward IV. is the subject of the fourth tablet; the fifth subject is that of James Watt describing his improvements in the steam-engine; the opening of the Liverpool and Manchester Railway forms the subject of the sixth representation; lastly, Britannia instructed by Wisdom is represented, offering the olive branch of peace to the four quarters of the globe. Above the ordinary hour circle, the change of each month is indicated by the appearance of the corresponding sign of the Zodiac. Mr. Walker also exhibits three watches, having plain enamelled dials with black figures, and one with a black face and white figures: this has rather a singular effect.

No. 19. H. Delolme exhibits seven handsome watches with various movements; two marine chronometers; also, a movement for chronometers as made in Lancashire to his own calliper, and four watch movements.

Thomas Airey, of Dale-street, Liverpool, contributes two watches on a new principle, which, however, is not at present made known to the curious.

32. Messrs. Jackson, of Clerkenwell, exhibit their soli-clave watch, the advantages of which are flatness in the capacity of the works, and economy as regards cost. The key has a solid square, in length equal to the entire thickness of the watch, which ensures greater durability: ordinarily the winding square is often little more than equal to one diameter in length whereby both key and square are injured. The same firm exhibits also eight gold watches and two of silver, a small clock in a wooden case, and a chronometer.

26. The "tiny watch" of the British collection is contributed by Edward Funnell, of Brighton. It is in size equal to a three-half penny piece (Maunday money), is jewelled in fifteen holes, and goes twenty-eight hours with only once winding. This, however, is much larger than its Lilliputian competitor sent from Switzerland.

30. H. A. Davis, aged only eighteen years, exhibits two escapements, made by himself without the aid of machinery; the one known as the "horizontal," the other as the "duplex." These examples of industry and talent at so early an age are certainly very creditable.

7. Mr. Hutton contributes his patent clock, having a new compensation pendulum and a barometric contrivance to prevent the error arising from the changes in the density of the atmosphere. The pendulum, as that of Messrs. Aubert and Klaftenberger, is made of glass, which, being less affected by changes of temperature than metal, is not so liable to error, to be corrected by compensation. The metallic compensation is effected *without any friction* by the ascent and descent of two spring levers with three adjustable weights; the position of the levers is regulated by two long and fine steel wires, the lengthening of which allows the springs to raise the balls, and the shortening of the same to lower the balls. The mode of compensating by this pendulum is exceedingly simple, and is effected by loosening a screw in the top of the ball, which, in case of heat, is moved towards the centre of motion of the spring lever, or in the contrary direction in case of cold. The glass rod is attached to the pendulum-spring, by means of a screw, cut on it; and at bottom, a glass regulating nut works into a glass screw, cut on the bottom of the pendulum-rod. The compensating wires being of very small size, a simultaneous action is ensured at each change of temperature In the barometric contrivance, which is placed on one side of the interior of the case, the ivory piston rests on the mercury, thus counterpoising the air-vanes, so that, when the barometer is low, it causes them to approach the plane of the pendulum's motion, and raises them, on the contrary, when the barometer is high: thus the mechanical resistance to the pendulum is increased or decreased according to the density of the atmosphere.

Mr. Hutton also exhibits his marine chronometer, with pneumatic auxiliary compensation, the object of which is to get rid of the "errors of extremes." This is effected in the present instance by placing a light cap over the balance, so as to enclose the air immediately around it only when the thermometer is at temperate; thus the balance being confined to this space is made to go slower at this temperature: when the temperature either rises or falls the cap is gradually moved away from the balance by the action of a metallic thermometer, from which motive power is obtained.

In addition to the above, Mr. Hutton's patent lever pocket chronometer is shown, with compensation stud for changes of temperature.

17. A clock in a case of Egyptian design, surmounted by sphynxes, is exhibited by Webster, of Cornhill. For the ordinary figures from 1 to 12, the signs of the zodiac are substituted.

Connell, of Cheapside, contributes two chronometers complete and one without dial, &c.

Cousens and Whiteside exhibit a sporting watch in silver case, adapted to many scientific purposes. It has an independent hand beating six times in a second.

William Birch, of Gracechurch-street, shows a chronometer and a small gold watch.

From the establishments of Oldenshaw and Co., of London and Coventry, we find a chronometer, a chronometer movement, 26 gold and silver watches, some of which have a Swiss finish, as also three sets of works.

Mr. B. B. Loseby exhibits six examples of his mercurial supplementary compensation balance for chronometers, the object of which is to remove the defect of the ordinary compensation, which causes the chronometer gain in the intermediate temperature on account of the balance spring losing elasticity at an accumulating rate over the effect produced by the compound laminæ. This error is removed by the addition of curved tubes, in shape like the letter S, containing mercury to the ordinary compensation; each portion of the tube is less inclined to the radii of the balance as it approaches the centre, and consequently, as the mercury expands with an increasing temperature, an accumulating effect is produced on the momentum of inertia of the balance in proportion to the curve and inclination of the tube, which could therefore be adjusted to any progression which the law of alteration of elasticity of the spring might require.

Mr. Bennett of Cheapside contributes, in addition to that already mentioned, a clock in a handsome oak case, a carriage clock, two chronometers, a gold hunting watch, and a movement.

Adams and Son, of Clerkenwell, exhibit a collection of twenty-one gold and silver watches of different sizes and patterns.

10. Samuel Lowry contributes a detached escapement chronometer, a small watch movement, a gold chronometer with spiral spring, &c., a dead seconds lever watch invented by himself, a lever watch for ordinary use, and a movement.

16. Howell, James, and Co., exhibit two large clocks in gilt cases. The one designed by George C. Adams is surmounted by a figure of Jupiter presiding over all things; on the two sides are Apollo and Diana in their chariots drawn by horses, indicating the approach and departure of day. In front are dancing figures representing the twelve hours of the sun; finally, "Spring" and "Autumn" are shown strewing fruit and flowers on the earth. The dial is enclosed by a wreath, the gilding of which is very badly executed. The second ornamental clock is smaller, and altogether of less pretensions.

In addition to the above is a third ornamental clock and an eight-day timepiece, designed by Cole.

40. Brockbank and Atkins exhibit a complete chronometer and a chronometer movement.

13. T. R. Holl exhibits his newly invented index watches, six altogether, in hunting and plain case.

66. A clock, in flat polished case, on the dial of which, in addition to the ordinary hands, are shown the days of the week and month respectively, is contributed by Joseph Kaiser, who has also sent a "tell tale" for the use of watchmen and others, by which their absence at any given time is clearly indicated.

91. Six articles are furnished by Messrs. Vieyres and Repingon, including a two-day marine chronometer fixed on its gimbals, a gold lever hunting watch, and three gold and one silver watches in plain cases.

47. William Harvey, of Stirling, N.B. exhibits an eight-day striking clock, with only one mainspring and one train of wheels to do all the work, including the striking, which is performed on one bell placed on the top. This is certainly a step in advance.

43. An elegant gilt model of Lichfield Cathedral, with its clock in front, is contributed by Mr. C. Thorneloe of that city; also, two handsome skeleton clocks, which are exhibited by the same person for "neatness of design."

9. Thomas Yates, of Preston, shows his patent dead-beat half-seconds clock, as also a skeleton clock of neat design.

14. A handsome English chronometer, in black marble case, the pediment of which is supported by four caryatides, is exhibited by Thomas Adams.

31. Thomas Cole exhibits a horological eight-day lantern, a flat clock of new design, a *small eight-day clock*, about 2½ inches high, and about 1¾ inches wide, and four semi-circular flat clocks. These clocks are very unique, both in construction and general appearance. The days of the month are shown to thirty-one numbers in the semicircular space next to the top margin of the clock, while the hours and minutes are represented in a circle placed in the upper part of the dial, and the days of the week and the month in two smaller circles below. There is also a similar flat clock, forming the back of an inkstand—a most appropriate introduction, and something similar to a like arrangement by Mr. Whishaw in his "Telegraphic Despatch-box."

34. Messrs. Barraud and Lund exhibit, as a specimen of "minute English manufacture," one of their pocket-chronometers; also a chronometer and chronometer movement, respectively.

53. A chronometer, with improved compensation balance, is exhibited by J. Pennington, of Camberwell.

85 Alexander Watkins contributes an original eight-day chronometer repeater, which he states to have been produced by the labour of eight years. It strikes the hours similarly to the old striking watches, and chimes the quarters on five bells; it also shows the day of the month, the whole consisting of 200 pieces of mechanism, including a newly invented compensation pendulum to equalise the extreme temperatures; also another, similar to the above in external appearance; and two very small *chronometers*, supposed to be the *smallest of the kind in the world*.

154. For actual utility, the different parts of a watch and the various escapements in ordinary use, as sent to the Exhibition by a few British and foreign contributors, must be considered as the most important contributions in the horological section, as affording information to the visitor which cannot be obtained by merely seeing the exterior of a watch. Such are the various escapements on a large scale as exhibited by Messrs. Robert Bryson and Sons, of Edinburgh: first, the vertical escapement, showing the action of the regulator; second, the horizontal or cylinder escapement, as in Swiss watches; third, the duplex escapement; fourth, the lever escapement; and, fifth, the chronometer or detached escapement.

(To be continued.)

IBBETSON'S CASTINGS.

IN a glass case, in an obscure passage near the entrance to the machinery in motion, are placed three specimens which are entitled to some consideration, from their novelty and beauty. There are three kinds of castings in this case, and each may be said to contribute a new power to the manufacturer. The first of these comprises castings in brass from works of nature, and in this way Capt. Ibbetson has contrived to render the leaf, with all its detail, in a manner which has not heretofore been accomplished. Chantrey some years ago had a high appreciation of casting from nature, and he devised means by which the object was encased in clay, baked, and then the powdered part driven out by means of a current of air; but he could only take one cast from a mould, whilst Captain Ibbetson states that he can make any number of copies. He exhibits, also, a casting, of brass, of a raised map of the Isle of Wight, which may be useful for educational purposes. This model, although of small scale, is made from his own surveys, which he has represented in the wonderful geological model in the Western Nave. Prince Albert, who, from his own geological knowledge, is so well qualified to judge of the merits of such a production, has already intimated that it ought to become the property of the island—that it could not fail to be of the highest interest to all who visit that charming spot.

The second kind of casting consists of deposits of an alloy of gold and copper by electrical agency. Now, electro-metallurgists state that these depositions are in the highest degree difficult, because the current will reduce that metal which requires least force, to the exclusion of the rest. Ibbetson states that his specimens have been analysed, and they are found to consist of an equivalent of each metal, a fact of much interest to the chemist. By this plan he has covered the fairy-like maiden's hair fern, the pitch plant, the humming-bird, and many other curious species which he has procured from the national gardens at Kew. The mode by which he obtains these results he at present keeps secret.

The third invention consists in a new mode which he has discovered of bronzing iron. He states by his plan he contrives to throw the bronze, as it were, into the texture of the iron, and that it dispenses with the use of varnish or any other similar substance. The specimens exhibited are very beautiful, and it has been reported that the Coalbrook Dale Company are thinking of adopting the invention, which is also, for the present, kept secret.

The importance of these specimens is not so much to be found in their own merit as in the power which they afford to the manufacturer to extend processes in directions hitherto unknown. For this reason, we attach considerable importance to them, and we recommend them to the attention of the manufacturers, to ascertain how far they may be economically and usefully adopted.

POTTERY.—BY AVISSEAU.

POTTERY.—BY AVISSEAU.

POTTERY. BY M. AVISSEAU.

The cup and dish of coarse pottery ware exhibited by Mons. Avisseau, are admirable imitations of the ware made by Bernard Palissy, in the sixteenth century. The fish, dolphins, frogs, plants, &c., which ornament these and the other specimens displayed by M. Avisseau, are modeled with great spirit, coloured with much taste; in fact, these examples are very close imitations of Palissy's renowned ware.

RIBBON PATTERN.—BY LARCHER AND CO.—(SEE NEXT PAGE.)

IVORY CASKET.—FROM DENMARK.—(SEE NEXT PAGE.)

BROADWOOD'S PIANOFORTE.

Messrs. Broadwood and Co., amongst their numerous splendid pianofortes, exhibit one very highly embellished by Mr. Morant—the design sculptured and gilt. We have engraved the head of this pianoforte as an example of what may be done in this manner.

END OF PIANOFORTE.—BY MESSRS BROADWOOD.

WHITE AND GOLD CABINET.—MR. INGRAM, BIRMINGHAM.—(SEE NEXT PAGE.)

BLACK MARBLE VASE.

This vase and pedestal are made from the jet black marble of Derbyshire. It is one of a pair exhibited, and is noticeable from its size and good outline. The handle is somewhat weak in character, but, as a specimen of simple form, the vase itself is good.

BLACK MARBLE VASE.—MR. TURNER, BUXTON.

RIBBON PATTERN. LARCHER AND CO.

The manufacture of ribbons has always been a *spécialité* with the French, the Lyons fabrics being especially remarkable for variety and beauty of design. We engrave one, a specimen of many sent by Messrs. Larcher, Faure, and Co., which is remarkable for the novelty of the pattern. It is of arabesque character, and has the merit of novelty; besides being extremely effective, the interruption of the conventional ideas of curved lines is at least deserving of commendation for the originality it displays.

IVORY CASKET. KLINGSEY.

In the Denmark Court, the contents of which are very limited in quantity, there are yet some very elegant and pleasing productions in fine art. Of this character is an ivory jewel-casket, ornamented with basreliefs and a group after Thorwaldsen's "Ganymede." The style of execution is very perfect, and almost worthy of comparison with works of the *cinque cento* period.

INGRAM'S CABINET.

The cabinet of the Louis Quatorze period, manufactured by Ingram, of Birmingham, and exhibited in the Fine Arts Court, is certainly one of the most *récherché* articles of decorative furniture in the Exhibition. It is of white enamel and gold, the panels relieved by the introduction of bird subjects very delicately painted. The recesses at each end are glazed, and at the back is a mirror. The enamelling is upon wood, laid on cold by a new process. The ornamentation, which is rich without being redundant, is especially noticeable for its beauty of style and finish.

SILVER INKSTAND. DODD.

The silver inkstand by Messrs. Dodd exhibits a very pretty design, the two little figures being very well to the purpose. It is extremely well executed.

SILVER DISH. ANGELL.

The silver dish by Mr. J. Angell is embellished with a subject designed to honour and commemorate the Great Industrial Exhibition—her Majesty, as Britannia, receiving the contributions of the various nations of the earth: in the rim are a medallion containing profiles of the Queen and Prince Albert, and others allegorical of the four quarters of the globe. The design is by J. Henning, jun.

SALT-CELLAR. MARTIN AND BURKETT.

The salt-cellar by Messrs. Martin and Burkett, of Cheltenham, is of plain design; the shell, supported by juvenile Tritons, is happily typical of the briny deep.

SCOTCH MULL, &c. LISTER.

The Scotch mull and silver claret jug, by Messrs. Lister, of Newcastle, are very creditable specimens of manufacture. The former, an *objet de luxe* peculiar to our northern friends, exhibits an amount of brilliant ornament in the details which we have seldom seen equalled. The snuff-box is covered with a handsome cairn gorm.

DELARUE'S ENVELOPE MACHINE.

THERE are certain points of attraction within the Great Palace of Industry which cannot fail to be discovered by the visitor who for the first time enters the Building, owing to the large number of persons congregated around such attractions from morning until evening. Thus, in the Foreign half of the Building, the Austrian sculpture, Power's "Greek Slave," the Queen of Spain's diamonds, the model of the birth-place of the illustrious president of the "World's Fair," the beautifully executed models of various animals from Prussia, the malachite doors and vases from the Ural Mountains, and the display of Swiss watches, are unmistakeable centres of attraction: while in the British division the jewels from the East in the Nave, and those contributed by British exhibitors in the Middle Gallery south; Cox's aërated water apparatus; Appold's, Bessemer's, and Gwynne's centrifugal pumps, respectively; Applegath's vertical printing machine; Crabtree's card-setting machine; and, finally, the envelope machine of Messrs. Delarue, in the Nave, and that of Messrs. Waterlow, in the Machinery in Motion department, collect together at all times the largest number of persons.

In our present notice we have only to do with the extraordinary machine of Messrs. Delarue, which occupies so conspicuous a place on the north side of the western or British division of the Nave. How by some unexplained mystery it got placed away from the Machinery in Motion we are unable to say; one thing is certain, every visitor *endeavours* to obtain a sight of it.

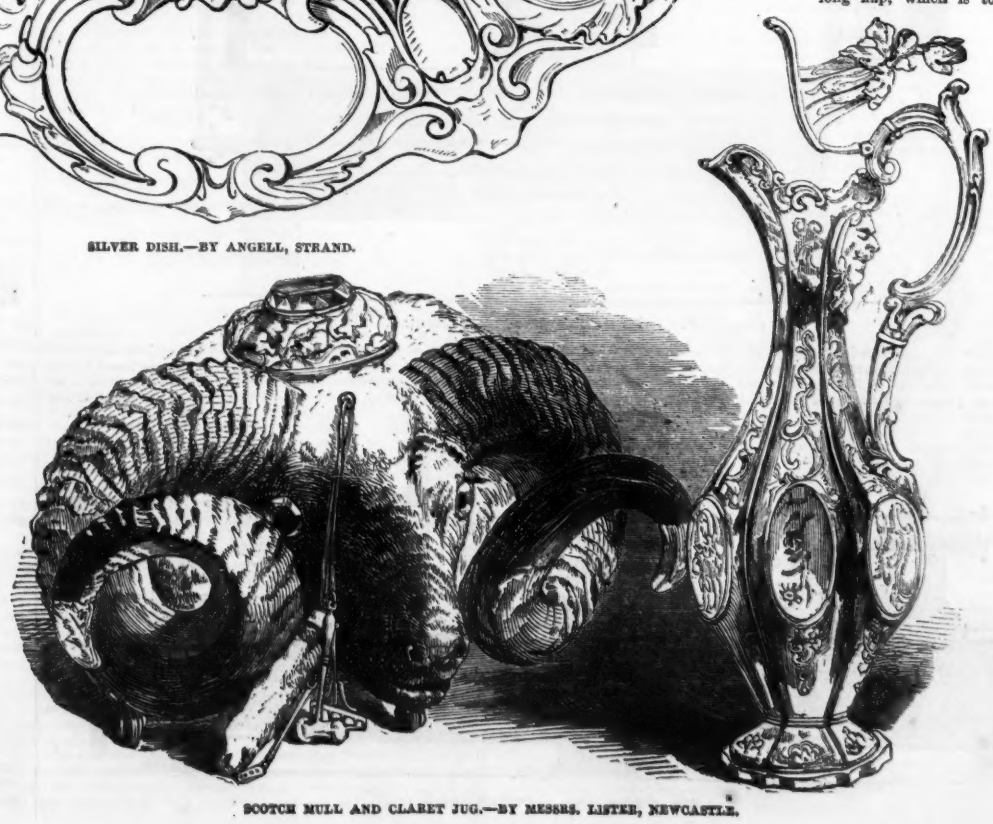
Although not so simple in its construction as that of Messrs. Waterlow, the envelope folding machinery of Messrs. Delarue presents a series of the most beautiful mechanical movements it is possible to conceive. For the various contrivances for folding, gumming, forwarding, and delivering the envelopes, which were formerly done by hand, Mr. Warren Delarue has closely followed several natural movements of the human form divine; the cams especially exhibit a thorough mechanical knowledge on the part of the designer.

In order to estimate the value of this substitute for human labour, it may be as well in the first place to call the attention of our readers to the obvious mode of making an envelope without the aid of any machinery whatever. The first thing is to mark with a pencil on paper the lozenge form required to suit the particular size of an envelope to be made; the next thing is to cut out this form either with a knife or pair of scissors; the third part of the process is accurately to fold down the four flaps; the fourth, to gum with a camel's-hair pencil the under side of the angular margin of the long flap opposite to that which is to bear the wafer, wax, or embossed stamp; the fifth, to pass the fingers of the right hand over the upper or long flap, in order to join the three flaps together; and the sixth, to gum with a camel's-hair pencil the underside of the projecting portion of the long flap, which is to be

SILVER INKSTAND.—BY MESSRS. DODD, CORNHILL.

SILVER DISH.—BY ANGELL, STRAND.

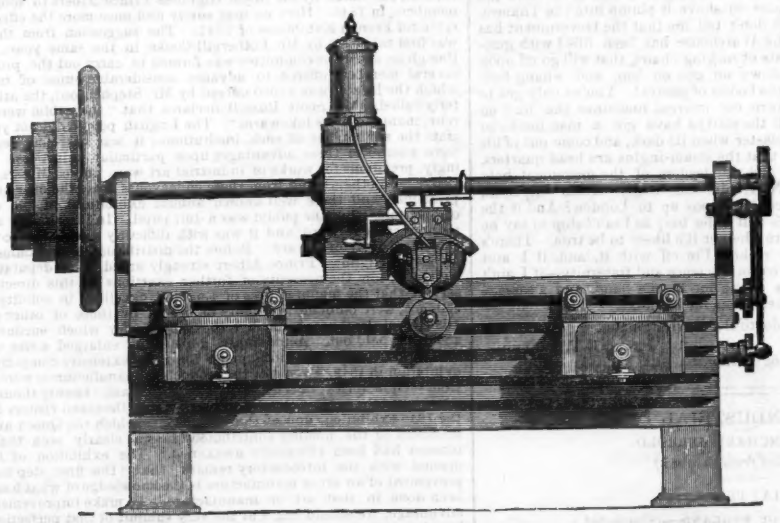
SALT-CELLAR.—BY MESSRS. MARTIN AND BURKETT, CHELTENHAM.



SCOTCH MULL AND CLARET JUG.—BY MESSRS. LISTER, NEWCASTLE.

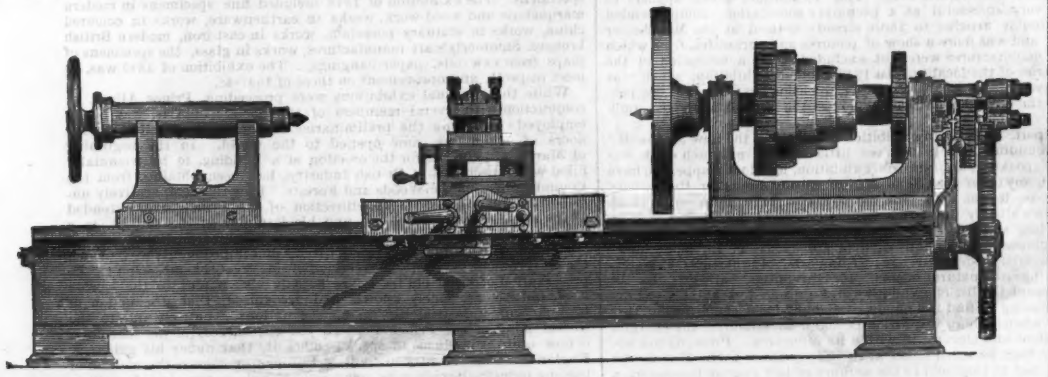
DELARUE'S PATENT ENVELOPE MACHINE.

fastened down to the other three flaps after the letter has been placed within it. It is quite clear, therefore, that, if envelopes were made in such an unworkmanlike manner as that described, the time occupied in finishing a hundred or a thousand would be such as to increase the cost to the consumer to a very considerable extent. The first and most obvious saving of time in the manufacture of envelopes on a large scale was to cut out several hundreds of pieces of paper of the required width by means of a horizontal steel cutter machine. This is the plan adopted by the Messrs. Delarue at their extensive works in Bunhill-row. These widths of paper are transferred to a powerful lever machine, into



PARR, CURTIS, AND MADELEY'S PLANING MACHINE.

which 480 thicknesses are placed at one time; a steel cutter, of the proper lozenge form, being interposed between the paper and the metallic pressure slab attached to the lever, which, being brought down upon the pile of paper by the rapid action of the machine, cuts it through in a few seconds. The cutting bed of this machine is made of lead, as wood of any description would be rapidly destroyed, and harder metal would equally destroy the cutter. The papers of lozenge form are now removed to the folding machine, and placed on an inverted ma'o-



PARR, CURTIS, AND DELEY'S LATHE.

gany box, on one side of the boy attending the machine. Having a good supply of lozenge-shaped papers, he takes the top one, and places it on the flat bed of the machine, between four vertical register guides, so that the four angles of the intended envelope coincide with the internal angles of the four guides respectively. It is owing to this arrangement, that the envelopes, when completed, are so perfectly true in respect to shape.

In the View of the machine presented in the present Number, the iron frame of which is firmly secured with bolts to the floor, are represented two boys, the one placing the lozenge-shaped piece of paper in between the guides already mentioned, at a rate of sixty per minute, and the other waiting to carry away the envelopes as finished: it is to be observed, that the carrying attendant at Messrs. Delarue's works usually serves several machines in action at the same time. In front are seen the *fast* and *loose* pulleys, with a band passing half round the working pulley, and thence passing below the floor to other pulleys in connexion with one of the steam-engines at work in the Machinery in Motion department. All the chief movements are obtained by means of cams on the principal shaft, which derives its motion from the pulley fixed on one end of it. The cams are five in number, viz. two double, two single, and a large central double cam, which works the double plunger levers seen with the counterpoise balls on the left of the view. The curved plunger in two parts attached to the levers is brought down on to the paper at regular intervals, the lower part of the plunger remaining down while the upper part is drawn upwards. The folders, which turn down the flaps in proper rotation, are worked by the two-side cams of the main shaft; and the other double cam of the main shaft gives motion to the taking-off apparatus, or "artificial hand," by which the paper is removed when folded. The two fingers of the hand are small cylinders, fitted at their lower ends with india-rubber, which is pressed on to the paper by a spiral spring within, similar to that used in Palmer's candle-lamps, the air being excluded by the closeness of the two surfaces, the paper is readily removed.

The envelopes, as completed, are transferred as already mentioned, by the artificial fingers, and are deposited on an incline metallic table, each envelope as it is finished being placed in turn at bottom of the pack by means of two small springs projecting above the table. An endless blanket now conveys the finished envelopes into a metallic case or shield, from which they are taken by the carrier boy; each envelope as it is delivered into the case is placed under the rest by means of small springs, as already described.

We have hitherto omitted any notice of the gumming apparatus, which is equally curious and ingenious with the other parts of the machine, motion to which is given by means of a small shaft, worked by a pulley from the main shaft in connexion with a segment lever and wheel at one end of the frame. The effect produced by this contrivance is, first, to move an artificial hand on to an endless moving blanket covered with gum, and afterwards to transfer the gum to the proper flaps of the envelope.

There is one other motion worthy of being noticed, which is represented in the view at top of the frame: this consists of a segment lever, the teeth of which work into the circular rack or screw, also shewn, the teeth of the rack again working into a small toothed wheel, by which each of the four flaps is made to perform a half revolution, the horizontal circular rack moving first in one direction and then in the other.

Eleven machines similar to that at the Great Exhibition are constantly employed at the extensive manufactory of Messrs. Delarue, in Bunhill-row, by which the large number of 396,000 envelopes are completed in a single day. This is only one of a great variety of mechanical contrivances of great beauty by which the numerous departments of Messrs. Delarue's extensive establishment are rendered capable of producing the most highly finished articles, whether plain, enamelled, coloured, or embossed.

PARR, CURTIS, AND MADELEY'S LATHE AND PLANING MACHINE.

Messrs. Parr, Curtis, and Madeley, of whose machines we give two Illustrations, are the owners of the Phœnix Works, Chapel-street, Manchester, which occupy a very large area, and include an extensive cotton manufactory, foundry, millwrights' shops, &c. The two great branches of the business in which they are chiefly engaged are well represented in the "Palace of Industry," for in the cotton machinery department they exhibit all the various engines used by them in that important branch of manufacturing industry, while of machines for manufacturing purposes they also make a goodly show.

The first Illustration is an elevation of their planing machine, by which metals are as easily planed as wood is by the carpenter's plane. On the left is seen the multiplying pulley, by which, in connection with a band or strap from a steam-engine, the motion of the machine is accelerated or retarded at pleasure, merely by shifting the strap from one step of the pulley to the other. It is self-acting, both angularly; it is simple in its several parts, and is evidently put together as regards metallic forms to be cut, either horizontally, vertically, or with an essential view to strength. The second Illustration is an elevation of one of the "slide and screw-cutting lathes," of the same firm. It will be seen that the main parts of this machine have a solid appearance, particularly the bed on which the whole is fixed. It is fitted with geared head-stocks, having a conical mandril, and case-hardened steel bearings and collar. The guide screw extends the whole length of the machine, and the compound slide rest is self-acting, both longitudinally and transversely. Motion is given to the machine by the same means as described for the planing machine, and which is shown on the right-hand side of the cut.

LETTERS FROM LONDON

ON

THE GREAT EXHIBITION AND OTHER MATTERS

BY PELEG E. WHEELER,

WITH AN INTRODUCTION BY BAYLE BERNARD.

(*Continued from page 529.*)

LETTER IV.—TO MR. ENOCH PEABODY, SAW-MILLS, PENOBSCOT.

THE EVE OF THE EXHIBITION! PUBLIC FEELING AND FOREBODINGS; FARMER AND MANUFACTURERS; RUMOURS OF AN OUTBREAK; THE MAJOR'S FLIGHT TO LONDON.

DEAR UNCLE ENOCH,—

You dont forgit where I pull'd up—where you asked me, as I s'posed what was the public feeling generally about the Exhibition, and speshally among the farmers; and now I've got to tell you, it was jist to larn as much as that that I've stopped here most a week afore I go to London. Doors don't open till the 1st, and as I'd got six days to spend, I thought I couldn't change 'em better, couldn't act with more discretion than to walk and ride about a spell, put my head into a door or two, and lay hold of any fellers I caught drifting about the country; for I reckon that's good policy. If you want to learn about fix'd interests, you must go to the fix'd classes, jist as you'd allers look for trees to know the natur of the soil. But in temporary matters the public mind is like a current, that swells or slackens, runs or eddies, as it's fed by sudden sources, and the drift upon its surface is jist the thing to shew its force. So I look'd out for a stray log or two, arter other means of measurement, and did as much as any trapper to get a notion of the stream—if I didn't it's a pity. If my appetite for knowledge warn't as great as Dr. Franklin's, didn't grow up into a hunger that allers looked for meal-time—if it warn't my most partiklar and predominant desire to see whether this grand idee stirred the Old World like the Nco—had shook it up as thoroughly, sot its heart a beatin' quicker, given a stiffnin' to its muscles, and made both deck and cabin, high and humble, rich and poor, come out as a single man upon the Exhibition ticket, I know'd it was so in London—that that was just a furnace where the fusing going forard, with none of the old forges, no cold air to the coals, but altogether the hot blast. But how about the country? says I. How is the feelin' balanced? do they go all upon my principle and keep the pressure down?

Well, for the sake of philosophy, as well as their own purses, I'm sorry to say they don't. I know you won't believe it. You never can imagine they're such an eternal heap of fools, but I vow if 'taint the fact, that half on 'em here don't think on it—don't seem to have ever heer'd on it; for when you mention it, they stare as if it 'twas one of our own airthquakes. There's a lot, that, like the farmer's, don't vally it a

mossel, don't see a grain of good in it, won't allow it will sarve any one except the manyfacturers; and another pile, agin, that are actooly dead agin it, that don't hesitate to tell you, it's a downright mass of mischief, and will turn out nothin' sh rt of a great national calamity. What do you think of that, Uncle? I wish I may be shot if I han't talk'd to people here, who vow that the "World's Fair" will bring a judgment on the country! Aint that a rise for eyebrows? can't see no sign of hope in it, no rainbow in the clouds, but jist the very storm itself! A sheet of gloom and terror, pack'd up to the edge with thunderbolts, and hiding, as it rolls up, every glimpse of the bright heavens.

Well, I've seen some sights in my time, some strange kritturs in our museums, and was allers told they were the most curus that ever took to breathin,' so I scarseley ever thought to see their beat in human bodies—to see walking, talking men, that ought to go into glass cases; but I swear if 'taint the truth, and it's only a proof to me, that we have some chaps, as had the Egypshuns, who are jist proper for embalming. What do you think they say, Uncle? why some on 'em will tell you that this meetin' of all nations is sure to breed the plague! Yes, a downright Turkey plague, jist as genooin as rhubub, that will sweep out half the capital, and, perhaps, the country in the bargain. Don't you call that weather knowledge—jist the genus for an almanac? The plague in a temperate climate, and a country where, they tell me, they get summer once a cent'ry! Still it's sartain, for all that; it's as sure to come as Monday; it will be first among the visitors; we may count on it as safe as if 'twas going to contribute—going to have a stand itself in the Great Warehouse of the World, and show specimens of its machinery, human dog-kennels, brute food, and grinding Turkey governments, by which, as well as any steam-press, it can work off its thousands hourly:—the plague indeed! as if, arter all, Uncle, that was the only one to skeer us; as if we hadn't a hundred others that make short work with us continoolly; as if there warn't a speshal grand one, the fine old mammoth plague of Europe, that, when nations come together, instead of lettin 'em shake hands, sets 'em to murder one another for the glory of their country. There are such places, Uncle, in the world as devils' exhibitions; and death's industrial energy may be studied there full size!

But there's another lot will tell you that this meetin' is irreligious—actually profane, Uncle; that it's expressly forbid by Scriptur, and is sure to bring down vengeance on all who dared to jine in it. They say a meetin' of all nations is only to take place when the world comes to an end, and to attempt the thing afore is jist one of those rebellions that has allers met with punishment. What do you think of that now? ain't your eyes a mossel wider? don't it clear 'em jist as cleverly as a pinch of Prince's mixtur'? The meetin' irreligious! Now, it's allers a rule with me, Uncle, that when people go to Scriptur' upon ordinary topics, it's because they don't know its use, and have got nothin' else to quote, and their piety and argyment might measure back to back, and I reckon here's a proof. They call the Congress another Babel: another Babel, that's its title—nothin' short of another gatherin' to erect a pagan temple, and, of course, with the same purpose, in defiance of the Creator. Now, take the sum of that; when the object ain't to build a tower, or anything, in fact, but to fill it with good furnitur'; and so far from defying Heaven, is to fulfil its great injunctions, is to bring all men whatsoever into the bond of peace and amity. That's shockin' wicked, aint it? to tell men who've been raised as enemies, who've been taught to hate and slaughter, that it's their interest as well as dooty to become good friends for the futur'. That's raally suthin' impious, even a'most too bad to write about. The World's Warehouse another Babel, where they spoke only one tongue till they were punished by confusion, whilst here they'll speak a hundred and only seek to jine in one—the common language of humanity. What will they tell us next, I wonder? Perhaps that the Prince is another Nimrod, because he sometimes goes a hunting; and Mr. Paxton another Adam, because he happens to be a gardener.

But the reel aint run out yet. There's another lot agin that have gone raving mad on politics; that look at the "World's Warehouse" as a sort of powder-house or bomb-shell, a revolutionary magazine crammed chock full of combustibles, that's all ready to explode as soon as the railways put their trains to it. Now, I vow I aint deceiving you, it's as true as our town clock, though it's noos more fit to bolt than for any man to masticate. It's actoolly the fact, that there are fools here who believe that this Congress of all Nations is nothing short of a big conspiracy—a meetin' of all the enemies England has got throughout the globe, who, under pretence of beginning business, are going to put an eend to her, are going to steal in a million strong without exciting any notice, and come down on her some mornin' airly afore she's well awake. Who mean first to dethrone the Queen, and give the Bank up for a scramble, and then burn down London and divide England into patches: the Government and people looking on, of course, quite paralysed, s'posing their terror didn't permit 'em to bolt off to the Continent. A rational story, aint it? Dont it read to the full as nat'ral as any passage in the primer. But you mustn't judge it yet, for it's got to git its crowning truth. It's a likeness, you may say, that's got all the striking features, but it wants the grand expression, and there's a touch to come will do it—will make it more than speaking—as Judge Gandy used to say of Colonel Trumbal's portraits. Call 'em speaking likenesses, I vow if they don't haller;" and I gess there's a yell in this one. Who do you think are to be the leaders in this treachery agin England? Now, take your time, don't hurry. Frenchmen, you'll say, of course, on account of the battle of Waterloo; Austrians, on account of Hungary; and Spaniards and Portugee, perhaps, on account of their liabilities—an easy way for a brave people to git rid of their old bonds. I thought you'd never hit it; I vow if they aint Amerikins—yes, Yankees every man on 'em, who'd do everything they could to send England under water; tho' she happens at this moment to be the plank on which they're floating—tho' she's taking all their cotton, and more than half of their tobacco. She must take their iron in the bargain, in exchange for her own gold!

Now, aint this enough to rile a man—to rise the dander of a Quaker? Don't they use us scandalous, to throw dirt at us in this way? Aint we never to be forgiven, because we wouldn't stand oppression from a borough-mongering Parliament, which they kick'd over themselves only twenty years ago, and so from useless colonists grew up to be good customers? But, then, these fellers say to me, "Why, we've read it in your papers, speshally the Noo York ones; seen the entire skeme in print—the whole road of it mapped out, so that you could not mistake a turning." Ah! they're knowing fellers, aint they, Uncle? They've got a wrinkle round their eye-lids, and can see all round a hill as clearly as most folks. They've found out a snake bed, aint they? They know a heap about our papers—who owns 'em, and who edits 'em; they can tell that to a man, tho' they don't keer to inform us; that an Englishman writes for one, and an Irishman for another; and, as a cross betwixt the two, perhaps a Scotchman for the third. I should like to ask these fellers, what's been the great cuss of our country—only to answer that; but, as they couldn't in half eternity, I'll just tell 'em that it's this: that she's been the asylum of all the scoundrels England hain't been able to transport—been a sort of doctor's basin, to catch all her stagnant blood in; that every prime rogue of her raising, the day he could cheat no longer, has run off to Amerika; and what has he done there? Why, by way of getting credit, of course, he's call'd himself a victim, and set to work abusin' England in order to account for his desertin' her. He was an honest, industrious feller, who was crush'd by a conspiracy of the infernal aristocracy, not to say the King himself, and he thanks the stars we've got a press, in which he can pour out his indignation, or in other words a spout in which he can turn his dirty water. So he puts his hate in print, and it goes right off to England, and then its ketch'd up, and they sing out—"See the feelin' of Amerika." But there's more to comit than that, there's the Irish in America. What's to be said of them? This last ten years has brought us over half a million of those fellers, and what do they tell us is the cause? misery and tyranny, famine and bad government. But do they say as much at home? Every mite, and suthin' more. Jest look into their own papers, and if you want to know what stands for Satan, you'll allers find it's the word Saxon. If you want to know how England's hated, and who are the proper fellers for a steam force of malignity, a sorter hundred cussing power, I guess you'll find it's them. Well, are they likely to get more civil arter the expence of emigration? Aint it natral they should bile up with a double head of scum? Yes, but now they're become Amerykins; and when they're ladled up in England, "Look here," cry out the noospapers—"see the nashonal antipathy!"

And so much for the feelin' generally about the Exhibition, but there's a speshal kind to menshun. What do the farmers think about? what's the fashion of their notions as to its objects and results? Well, I think I've said already, they don't vally it a mossel; don't see a grain of good in it, as far as regards themselves. But I guess that aint the tote on it; there's suthin' more than that. So far from givin' help, they rather think 'twill harm 'em. They consider it altogether as jist a move of the manyfacturers—a great dodge of the cotton spinners and the fabricators gen'rally to bring their wares into more notice, and enlarge their foreign trade, and in the measure that it's likely to benefit the spinners they think 'twill hurt themselves. That's a sound conclusion, aint it?—shows the lads have had some schooling, are first-rate hands at cyphering out their stake in the communitys But as there's a word to say on this point, it's right to jot it down.

Now, there can't be a doubt, Uncle, that the farmers are over-loaded; that since free-trade has set in, the weight has slipp'd on their side, just as it had lodged itself afore upon the public shoulders ginerally. But the question comes to this: Is this the time to shift it? It's as easy to see as sunlight, that there's a pull jist now up hill. That England's got to get on higher ground to maintain her old position, and that her only chance of doing it is by means of manyfactures, which have jist been given head, and put freely to their work. They're sure to pull her up, with all the load she carries. They're the leaders born to do it. But there's a strain on the hull team; and the shaft horse staggers dreadful, is e'en arnest down-doubled. That's plaguey bad it's sartain, and you've jist a choice of evils—for the team to go ahead, and the shaft horse to stagger on, 'till they've topp'd the rise afore 'em, and got things upon a level, or pull up dead at once to give him dus relief, and run the chance of the hull machine breaking down, and turning over. If the drivers know their work at all, they'll sing out "Go ahead!"

But there's another point to settle. It's a question, arter all, whether the farmers aint brought their present weight upon themselves in doing what they did to prop up the old war system, and for no reason in the world but because it brought high prices. Whilst that system lasted, of course it made their fortuns; they'd the feedin' of the country, and of course could charge jist what they pleased for it. But when peace came and prices fell, what was the story then? why that half on 'em fell too; went down whop as quick as Bonyparte, who, arter all their swearin' at him, I guess, was their best friend—was just the crutch they leant on, the prop to their shaky houses. He was their famine upon horseback, want and scarcity in uniform. General Bonypart, I reckon, was their general excuse; so, of course, the battle of Waterloo settled them, as well as Europe, and sent those who'd saved their money to take keer on it in Ameriky; whilst it left all those who hadn't, to pay the price of the fun in England; and yet, would you believe it, Uncle, that there's hundreds of those fellows who would like to have the fun repeated! I vow if 'taint the fact, tho' they're groaning under the debt that all this fighting's heaped on 'em. They're sich everlastin' stoopids as to wish to make it bigger. A war, they say, is the thing that makes money cirkelate, and sets trade agoing properly; and it's good for mind as well as body. A country raally stagnates without a tussel now and then. It's like a feller as wants exercise, loses the use of half his muscles; no, a war—a war's the thing, that would send up wheat agin to a hundred shillins a quarter, set the farmer on his legs, and put every thing in motion: and so I guess it would; every body that had got a pound it would put in motion to Ameriky, and leave the class that had all the benefit to settle with their creditors.

Now, it is to pull the country out of the quag hole that the last war shoved it into, that the manyfacturers are working. It is to try to git a surplus by means of noo and more production, and then to adjust taxation and make the preshur even; and I want to know who but the farmers will come in for the first lift? And yet, would you believe it, Uncle, they either can't or won't allow it; they actually vow, upon the contrary, that this move will be their ruin; that they're already half gone as it is, but that this will top the bushel; that, instead of the manyfacturers being a yoke of bullocks, who will haul 'em for'ard, they're jist a set of prairie colts that will drag 'em clean over a precipice. They look at 'em, in fact, as their nat'ral born enemies, and wont allow it's possible that the two can ever thrive together. Because they're different classes, they hold there's a deadly war atwixt 'em, and a country can only prosper when one of the two is undermost, and I 'pose I needn't tell you which of the two they mean. Now aint that a pretty doctrine? a nat'ral born enmity 'twixt a pair of the vital organs—'twixt the right leg and the left one, or the two sides of the heart, the valve that's pumping in the blood, and the valve that's pumping out, when the welfare of the system depends on them conjointly—to talk of screwing up the stomach, in order to benefit the lungs!

Now, this being the case with them, you'll see, of course, it follows that——Hallo, hold on a bit; why, marsy on us, Uncle, what do you think's the noos from London, brought by the train just in, that's come all the way full split, like a thunderbolt in oil-skin, or a cow down old Niagara? Why, that the talk was true enough. There's a revolution brewing—a conspiracy's been found out of Socialists and Yankees, who are going to blow up the World's Warehouse, and then burn down the capital, unless they find it easier to shove it plump into the Thames. I wish I may be shot, if they don't tell me that the Government has found out all about it. How the Warehouse has been filled with gunpowder, smuggled in in the seats of rocking-chairs, that will go off upon percushun. Let a feller sit down on one on 'em, and whang he'll go thro' the sky-light. And in the bodies of pianys! You've only got to touch their keys, and they'll turn out infernal machines the hull on 'em. That it's s'posed that all the stattys have got a man inside of each on 'em, wholl break the plaster when its dark, and come out of his shell like a young rooster; and that the steam-ingins are head-quarters, chock full of red Republicans; and the leaders of the movement hold their sittin's in their bilers! Now, aint this really suthin' frightful, speshally as I've sent all my contributions up to London? And if the city's to be demolished, science will suffer too; so I can't stop to say no more—can't stop even to enquire whether it's likely to be true. There's the last train going off, and I reckon I'm off with it, and, if I aint doom'd to fall a martyr in the cause of science and fraternity—if I ain't going to be shot for holding a shake out in one hand, and a sassage machine in 'tother, you shall hear from me by next.

Your dootiful and affectionate,

PELEG E. WHEELER.

(To be continued.)

THE HISTORY OF INDUSTRIAL EXHIBITIONS

BY W. BLANCHARD JERROLD.

(Concluded from page 532.)

CHAPTER X.

THE EXHIBITIONS OF ENGLAND.—*(Concluded.)*

On the 9th of September, 1839, a deputation from the Gateshead institution waited upon the authorities of the Newcastle Institute, to request their co-operation in promoting an exhibition of works of art, machinery, &c., for the joint advantage of the two institutions, when a sub-committee was appointed, and an exhibition was opened at Newcastle, on the 7th of April, 1840. This exhibition, which appears to have been very successful as a pecuniary speculation, comprehended generally similar articles to those already noticed at the Manchester exhibitions, and was more a show of pictures and curiosities, from which models and manufactures were not excluded, than a collection of the great industries of the locality. In 1848 another exhibition, which was a comparative failure, took place under the same auspices: 192,000 people visited the first Exhibition; whereas the second attracted only 43,000.

At Devonport, in 1844, an exhibition was held in the new Mechanics' Institution building, which deserves little notice, inasmuch as it was not, strictly speaking, an industrial exhibition, nor does it appear to have originated in any other idea than that of raising funds for the society in whose house it was held. The exhibition of 1850, however, appears to have been a strictly industrial exhibition, divided into ten distinct sections. These sections were—1. manufactures; 2. raw materials; 3. models, machines, &c.; 4. philosophical apparatus; 5. naval architecture; 6. fine arts, modern masters; 7. fine arts, old masters; 8. water-colour drawings; 9. natural history; 10. antiquities, curiosities, &c. In running through the list of exhibitors and prizeholders at this exhibition, it is pleasing to find the names of so many local celebrities. It is a good sign when such an institution is found to stimulate the energies of the ingenious and clever men within its influences. Prizes do not appear to have been awarded either at the Newcastle or at the Manchester exhibitions; but at that held in the autumn of last year at Devonport, a large sum was set apart for this purpose; and, although the institution realised only £250 by the show, their plan must be held far preferable to that of the above-mentioned societies. We find ten guineas and a life membership of the institution awarded to Jebus Bickle, Hayle Foundry, for his model of an improved semi-rotary steam-engine; a bronze medal awarded to Joshua Truscott, of Devonport, for a model rotary and street sprinkler. Prizes in the form of books and instruments were also distributed on this occasion. These awards were made at a public meeting.

Leeds followed the example of Manchester as early as 1839, and copied the plan of that town as closely as possible. The exhibition was rather a bazaar than an illustration of local industries; it contained, however, some excellent specimens of machinery and produce, which, at all events, indicated the willingness of local manufacturers to present their several excellences to public view within the walls of a common building. Among the objects exhibited on this occasion, we find surveying instruments, chemical and philosophical apparatus, steam-engines; a machine in action for making cards for wool and cotton—its merit consisting in cutting the steel wires, to become teeth, to the proper lengths, bending them into the shape of a U, piercing the holes, &c.—by Messrs. Curtis and Co., Sowerby Bridge; Walton's machine for raising the nap on woollen cloth, as a substitute for the teazle; flax machinery; and a peculiar machine, invented and constructed by Christian Schuster, who had been originally a cowherd.

Birmingham was behindhand in adopting the plans of Manchester, which had already been so successfully imitated by Leeds, Newcastle, Liverpool, Devonport, Derby, and other manufacturing towns. Mr. Wallis, well known as the former director of the Manchester School of Design, claims the honour of having suggested, that, in the plans for the establishment of a Birmingham School of Design, a periodical exhibition of manufacturing art should be included. Although this suggestion fell from Mr. Wallis in 1842, it was not before September, 1849, that a great Birmingham Exposition of Industry was opened. This exhibition was the most complete of any which had been yet held in this country. It filled the entire area of Bingley Hall. It represented very fairly the great variety of manufactures carried on in the vicinity of Birmingham. All the most eminent manufacturers contributed something representative of their several industries. A complete set of specimens, illustrative of the history of the English plastic arts, was not the least remarkable part of the exhibition; and elaborate samples of electro-plating indicated the future importance of this beautiful process; and the Stafford potteries contributed some splendid wares. The completeness and high character of this exhibition may be attributed in the first place to the stimulus which the adoption of schools of design had imparted to the manufacturing arts; and, in the second place, to the influence of the splendid French exhibition of 1844, as well as the enthusiasm with which the great Free-Trade Bazaar, held in Covent-Garden, in 1845, was received. These various causes had undoubtedly awakened English manufacturers to a sense of the wisdom of concentrating specimens of their manufacturing progress into a building, at regular intervals, for their mutual instruction.

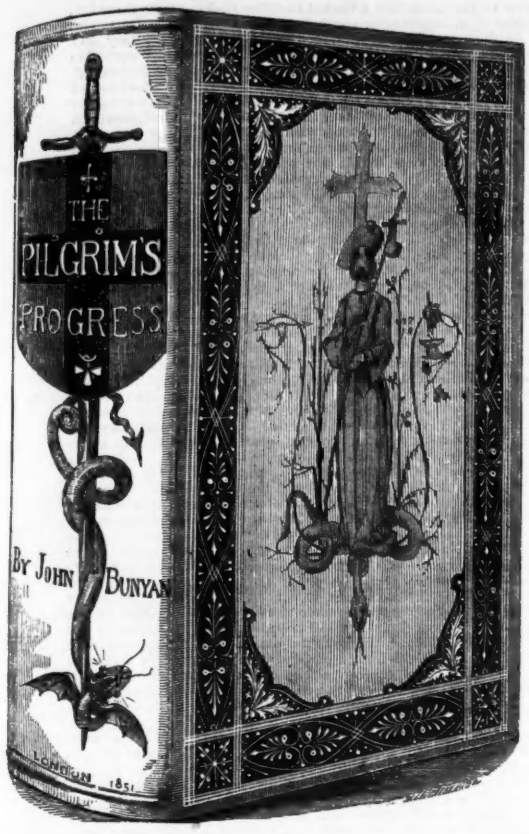
Of the Free-Trade Bazaar, remarkable and commendable as a commercial demonstration in favour of a political principle, no less than as a splendid picture of manufacturing England, it is not necessary to give a detailed account in a history of industrial exhibitions. It was a political bazaar, not a national exhibition.

Having rapidly traced the growth of provincial exhibitions in this country, and shown that, with one or two exceptions, they have been undertaken more with the view of raising funds for local societies than with the enlightened object of testing the relative excellences of local industries, the course of this history must return to the doings of the Society of Arts. It would have been a difficult matter to give a fair estimate of the enlightened efforts made by this body through a long series of years, and in the teeth of the most morbid opposition, had not Mr. Scott Russell compiled a statement of the society's efforts.

So early as 1844, Mr. Wishaw appears to have endeavoured to stir the energies of the British manufacturing public for the foundation of a great national exhibition of industry; but the records of the Society of Arts show that these commendable endeavours ended in two limited exhibitions within their walls, held in 1844 and 1845, the former of which was visited by 150 persons, and the latter by 800. The endeavour on the part of Mr. Wishaw is not here chronicled with the view of placing him before the public as the original propounder of periodical exhibitions in this country, since it is well known that so early as 1836 Mr. S. Richards, of Birmingham, corresponded with the Government relative to such a scheme; so that, in truth, the idea of a national exhibition of British industry (which, after all, is only an original recommendation to imitate France and Belgium) is fairly due to Mr. Richards. Mr. Wishaw, Mr. Wallis, Mr. Cole, and other gentlemen, have been introduced to the public as deserving almost exclusively the credit of working for the establishment of such exhibitions; but, before anything was known of these, Cornwall had set the country an example, Dublin had her periodical exhibitions, and annually the Society of Arts exhibited the specimens of manufactures to the producers of which it had awarded its annual premiums.

The earliest suggestion for the formation of periodical industrial exhibitions in connexion with the Society of Arts, was, according to Mr. Scott Russell, one made by his Royal Highness Prince Albert to some of the members, in 1845. Here we may surely find once more the effect of the splendid French Exhibition of 1844. The suggestion from the Prince was first taken up by Mr. Fothergill Cooke, in the same year; and, although an energetic committee was formed to carry out the project, and several members offered to advance considerable sums of money (of which the largest was £1000 offered by Mr. Stephenson), the attempt utterly failed. Mr. Scott Russell declares that "the public were indifferent, manufacturers lukewarm." The English people did not yet appreciate the advantages of such institutions; it was therefore resolved to force a sense of these advantages upon particular industries. Accordingly, premiums for works of industrial art were offered Messrs. Russell, Cooke, and others; and from these endeavours arose the offer of annual premiums, and these well-known annual exhibitions of the works of competitors. But the public was a dull pupil, In 1846 hardly any competitors came forward, and it was with difficulty the judges could find subjects worthy of reward. Before the distribution of premiums in 1846, his Royal Highness Prince Albert strongly urged on a deputation who waited on him the necessity of further exertions in this direction; observing that the manufactures of England, excelling in solidity and excellence, were outdone in beauty of design by those of other counties. His Royal Highness indicated the subjects for which encouragement should be held out. Accordingly, a new and enlarged series of prizes was issued, and preparations made for more extensive competition and exhibition in 1849. Even now the products of manufacturers were dragged from their factories; but the result was triumphant—twenty thousand persons visited the exhibition. No less than eighty thousand visitors attended the 1848 exhibition, and at that of 1849, to which the Queen and many members of the nobility contributed, it was clearly seen that public interest had been effectually awakened. The exhibition of 1847 was opened with the introductory remark, that "the first step to the improvement of an art or manufacture is the knowledge of what has already been done in that art or manufacture. To make improvements with advantage, we should begin at the very summit of that perfection which has already been attained." The exhibition was especially rich in artistic specimens of pottery and porcelain, glass, papier maché, and carving by machinery. Some specimens by J. Phillips were striking, and amongst the other fine specimens of the plastic arts were some beautiful manufactures by Messrs. Richardson and Co., of Stourbridge. In wood carving Messrs. Taylor, Williams, and Jordan exhibited some finely carved specimens. The exhibition of 1848 included fine specimens in modern marqueterie and wood-work, works in earthenware, works in coloured china, works in statuary porcelain, works in cast-iron, modern British bronzes, Summerly's art manufactures, works in glass, the specimens of soaps from new oils, paper-hangings. The exhibition of 1849 was, in most respects, an improvement on those of 1847-48.

While these annual exhibitions were proceeding, Prince Albert, in conjunction with several members of the Society of Arts, was busily employed arranging the preliminaries of the Great Exhibition, the doors of which are now opened to the world. In the beginning of March, 1848, a site for the erection of a building, to be triennially filled with specimens of British industry, had been obtained from the Commissioners of the Woods and Forests. How this comparatively unimportant plan, under the able direction of the Prince, was extended to the magnitude in which we find his last idea of the subject, is a matter which has been published in every channel of information throughout the world. The mortifications and impediments with which the Government delayed the execution of this great scheme, even to the preservation of a few old trees, are happily also patent to the world: it should be as widely known and recognised, that the notion of opening our industrial lists to all the nations is entirely due to the liberal mind of the Prince Consort. Of the success of his scheme it is now quite superfluous to speak; suffice it, that under his guidance England, the last country in civilised Europe to recognise the wisdom of holding industrial exhibitions, has sought to redeem the past by calling upon all the nations of the earth to compete with her in her own capital.



BUNYAN'S "PILGRIM'S PROGRESS."—BY J. AND J. LEIGHTON.

ENGRAVED GLASS GOBLET.—BY BOHM.

BIBLE COVER, IN METAL.—BY MESSRS. LEIGHTON, HARP-ALLEY.

BUNYAN'S "PILGRIM'S PROGRESS." J. AND J. LEIGHTON.

This characteristic binding to John Bunyan's immortal allegory was designed by Luke Limner, and most ably carried out by Messrs. J. and J. Leighton. In this binding the emblematical treatment is especially noticeable, and the workmanship is of a very high class.

BOHEMIAN GLASS.

The achievements of Bohemian art in coloured glass have long been matter of history, and they have until lately been considered to be beyond competition or rivalry. We are happy to have reason to believe, however, that within these last few years—since the removal of the hateful excise upon this branch of manufacture—the glass workers of England have made courageous and successful efforts to disprove this old prejudice, and have produced articles which, as to colouring alone, might safely stand beside the best from Bohemia, whilst in the quality of the glass they undoubtedly surpass the latter. Nevertheless, the Bohemian manufacture is still a very interesting one, and the specimens exhibited very beautiful. Our Engraving represents several of these, the designs of which are varied and pleasing.

JEWEL CASKET.—BY JENNENS AND BETTRIDGE.

BIBLE-COVER. BY LEIGHTON.

Messrs. Leighton exhibit many quaint devices for bookbinding, one of which, ornamented in metal for a bible, we engrave. It is of an antique character, and is designed by Luke Limner, who has distinguished himself by several other productions of this class.

ENGRAVED GLASS GOBLET. A. BOHM.

This most exquisitely engraved goblet, though exhibited in the Hamburgh department, is the work of Augustus Bohm, of Meistordorf, in Bohemia, and owes its location to the circumstance of its talented fabricator residing at Hamburgh. The skill displayed in engraving the glass, so as to produce a perfect bas-relief, is most marvellous; and, when the numerous figures in action and horses (for the scene is a battle-field), are taken into consideration, an extreme length of time must necessarily have been spent in its realization. The glass is pure flint, and colourless,

JEWEL-CASKET. JENNENS AND BETTRIDGE.

This is in papier maché, and is from the designs of Mr. W. H. Fitz-Cooke. In its general shape it is good, and the ornaments are well adapted to their respective places.

BOHEMIAN GLASS.

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